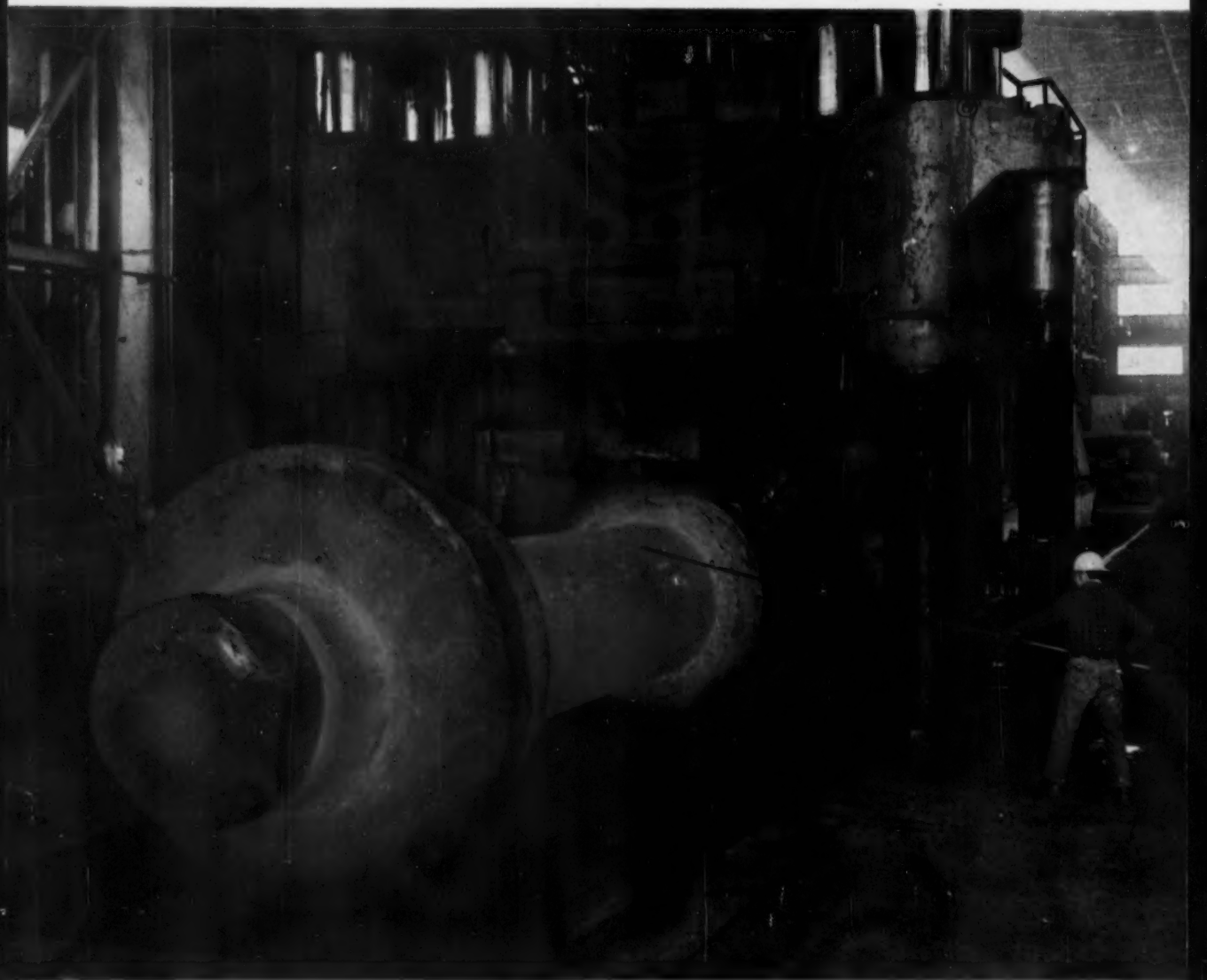
The IRON AGE
August 21, 1958 A Chilton Publication The National Metalworking Weekly



How To Get More For Your Forgings Dollar P. 89

Business Learns It Pays to Talk Politics – P. 59
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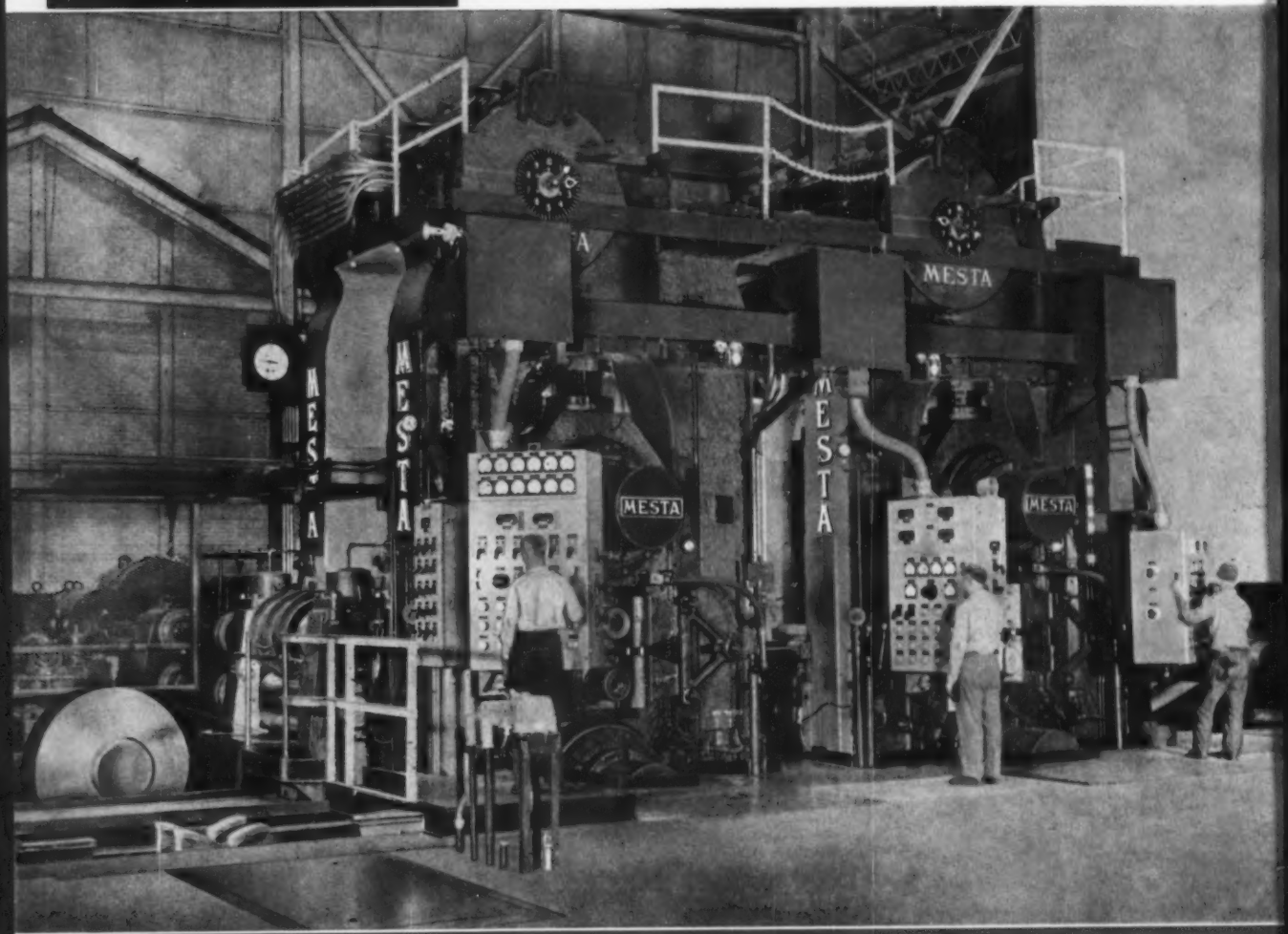
MESTA COLD MILLS



MESTA 51" Two-Stand Tandem Temper Mill Operating at the Yorkville Works of Wheeling Steel Corporation.

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MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Spring wire puts new life in old tires

Old tires begin a whole new life as raw material for durable, resilient doormats. And Bethlehem galvanized spring wire plays an important role.

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Indexed in Applied Science & Technology Index and Engineering Index.

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THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the Act of March 3, 1879. Price to the metal-working industries only or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Ironage," Philadelphia.

The IRON AGE

August 21, 1958—Vol. 182, No. 8

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BUSINESS AND POLITICS

They're Mixing—After years of shying away from political action, business men have become aware that their rights are in danger. Many are organizing grass roots campaigns within their own companies. P. 59

ELECTRIC LABOR

Makes SUB Demands—Negotiations between Westinghouse and IUE opened on a cordial note. But both took a firm position on the supplemental unemployment benefits issue. P. 64

INDUSTRIAL GIVING

Widespread, But Watched—Business donations take a sizeable share of the corporate dollar, but giving is not haphazard. Industry studies areas of needs, agencies serving them, and budgets donations. P. 65

WEAPONS LAG

A Campaign Issue — A Democratic-controlled House group says red tape is dropping U. S. further behind in developing new weapons. They also urge stepping up the pace of military research. P. 79

ARIZONA STEEL MILL

Coming Soon — Confident that Arizona's steel needs will grow, Yuba Industries is moving in a bar mill from California. First tonnage

Metalworking

FORGING PRACTICE: The giant forging on the cover introduces you to a special feature on steel forgings and their advantages. Knowing when to use forgings instead of castings or bar stock requires careful consideration. But it can pay off in dollar savings. P. 89

from the 36,000 ton plant is expected by year's end. P. 81

TAX WRITE-OFFS

Choose the Right One — Does the Reinvestment Depreciation Plan bring tax depreciation in line with inflation? Or do Replacement Cost or Current-Value plans offer the better solution? P. 83

FEATURE ARTICLE

HOW TO GET MORE FOR YOUR FORGING DOLLAR

Making a Choice—There is no simple answer to the question, "When should you use a forging instead of a casting?" All final answers must be based on considerations of operating requirements of the part, metallurgy, design factors, and ease of fabrication. P. 89

A Guide to Methods — Forging is a fabricating principle — not a single process. There are four major forging techniques, each adding to the versatility of forging production. They are: smith forging, drop forging, machine (or upset) forging, and press forging. P. 93

Choosing the Steel—Most of the plain carbon and low alloy steels can be readily forged. But costs make it mandatory that you choose your steels with economy in mind. From an engineering standpoint, choice of steel should certainly reflect the types of stress to be met in service. P. 96

Estimating Costs—Forgings are usually sold on a "per piece" basis. They are not sold by the pound, as is customary with castings. And forgings cannot readily be classified according to type. Their cost almost always requires individual treatment. P. 98

Purchasing Tips—When you buy forgings, there are a number of ways to cut machining costs. Such operations as straightening, coining, planishing, and ironing—all can be furnished by the forgings producer. Choice of a wide range of forgeable materials is an advantage in holding quality standards. P. 102

MARKETS AND PRICES

MARKETING

Help the Customer — Wheelabrator Corp. spends time and effort streamlining their customers' blast cleaning and cutting costs. The payoff has been booming sales that are expected to rise 40 pct. P. 62

FOREIGN WIRE THREAT

Brief Pause Coming—U. S. wire mills are encouraged because importers are quoting few deliveries for the fourth quarter. But respite will be brief with foreign competition as tough as ever in '59. P. 63

ALUMINUM

More for Autos—The aluminum industry is shooting for heavy automotive tonnage gains through wheels, blocks, bumpers, and radiators. Ford, GM, and Chrysler will use more in 1959 models. P. 74

INVENTORY CUTTING

Comes to an End—Metalworking firms are beginning to see the light. They consider further inventory cuts too risky in view of unsettled Mideast conditions. P. 129

FOUNDRY EQUIPMENT

Bidding Plentiful — Although sales are slow, foundry equipment makers are busy filling requests to bid on future work. If founders get busier it's expected these bids will quickly change into sales. P. 130

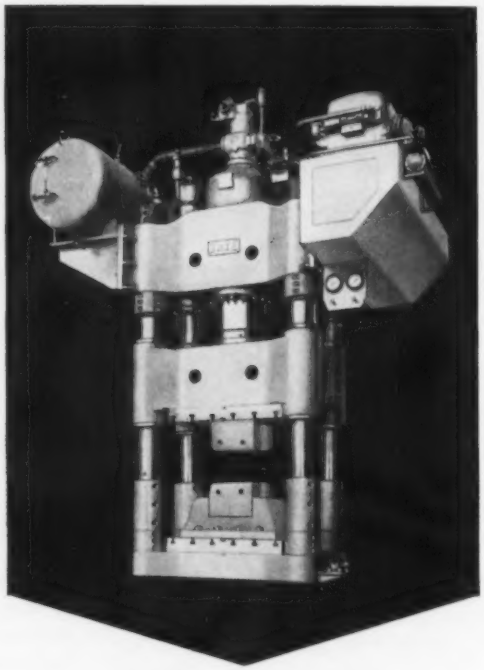
NEXT WEEK

REPLACING EQUIPMENT?

Step Carefully—Formulas for replacing industrial equipment are fine—up to a point. Next week's feature will examine the steps that should be taken above and beyond the formulas. In some instances, it is advisable to switch machines.

PRESS or HAMMER?

..which is best for your forged product?



When it comes to open die forgings, there are as many different opinions on what equipment is best as there are open die forge shops and open die forgings.

But, before adding any new equipment, the wise forge shop operator talks with Erie Foundry Company . . . the firm that makes the best in *both* hammers and presses!

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So . . . which is best for you—hammer or press? For expert and *specific* advice, talk to the recognized leader . . . Erie Foundry Company. Just call or write.

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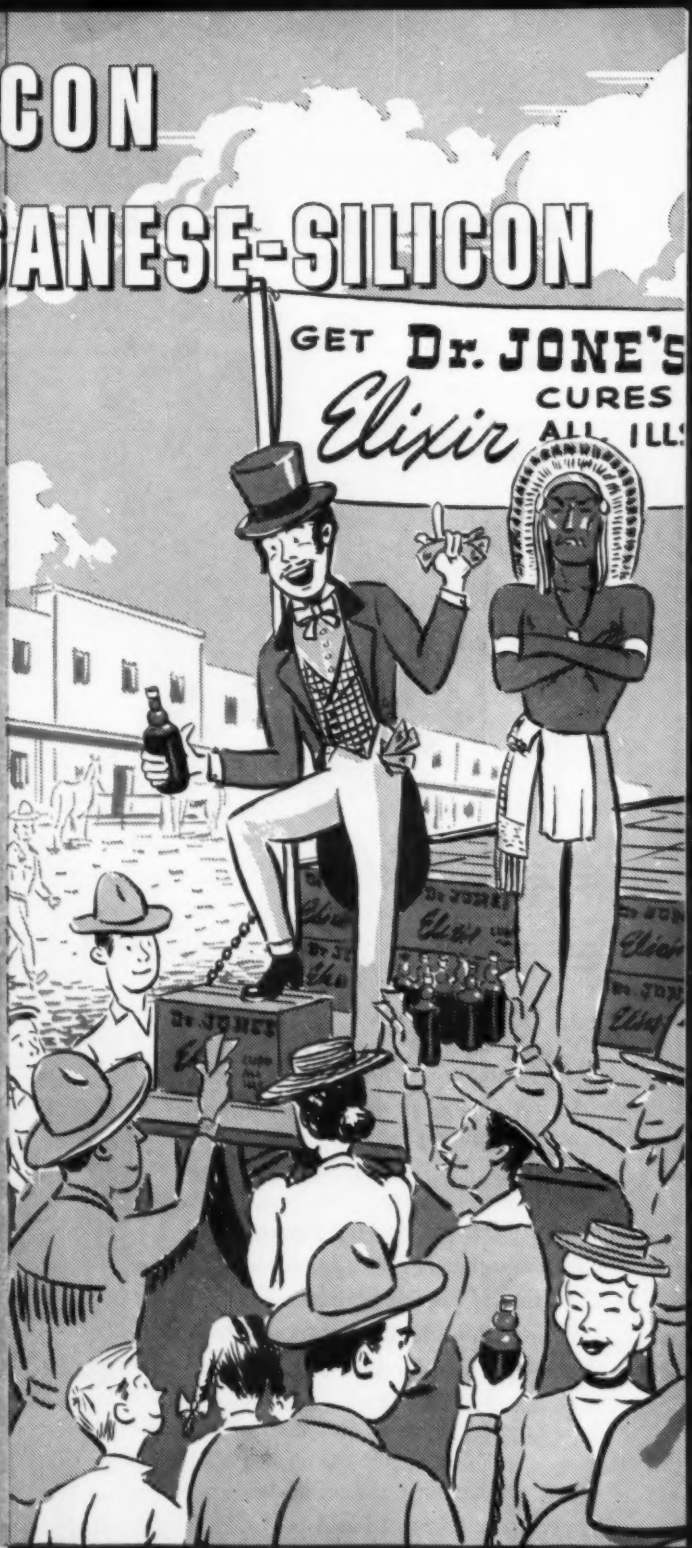

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Controls Won't Work: In Peace or in War!

There has been talk recently about controls—even though there is no shooting war. The idea seems to be that in order to keep from having a runaway inflation the easiest path is to slap on controls. It isn't that easy.

There is no certainty that controls would do our country any good under any circumstances. In a shooting war perhaps they might be necessary. Even then there is some question.

During World War II we had controls. But the so-called controlled prices did not always mean that was what we paid. There were often prices with no goods available—at the prices listed. In other cases we saw manufacturers hemmed in by higher costs—from which they could get no relief—making things that were not comparable in quality to former products.

Because war called for a "common" effort, the people were willing to stand still for controls. Often those who did the "controlling" were primarily interested in paper work, snooping, and flaunting their "power."

Today we have no shooting war. It is true that we have a very serious situation. It is also true that we face inflation fires due to higher wages and prices and due to the national deficits. The easiest way would seem to have stand-by controls just in case. Therein lies a danger.

Stand-by controls—or any other type—won't work without our giving up the very freedoms we say we are ready to defend. It is even questionable that the Federal Reserve Board should have the strong and far reaching power it has over our credit and monetary policies.

The place to make the proper correction in our way of life is to take the action ourselves. The President says the people won't stand for ever-rising wages and prices. Maybe not. But let's remember that the people wear two hats—consumer and worker (or management).

As long as the workers want more than earned productivity gains we are certain to be building up more trouble. And as long as management has to pass on the wage increases in the form of higher prices then we hasten the day of reckoning.

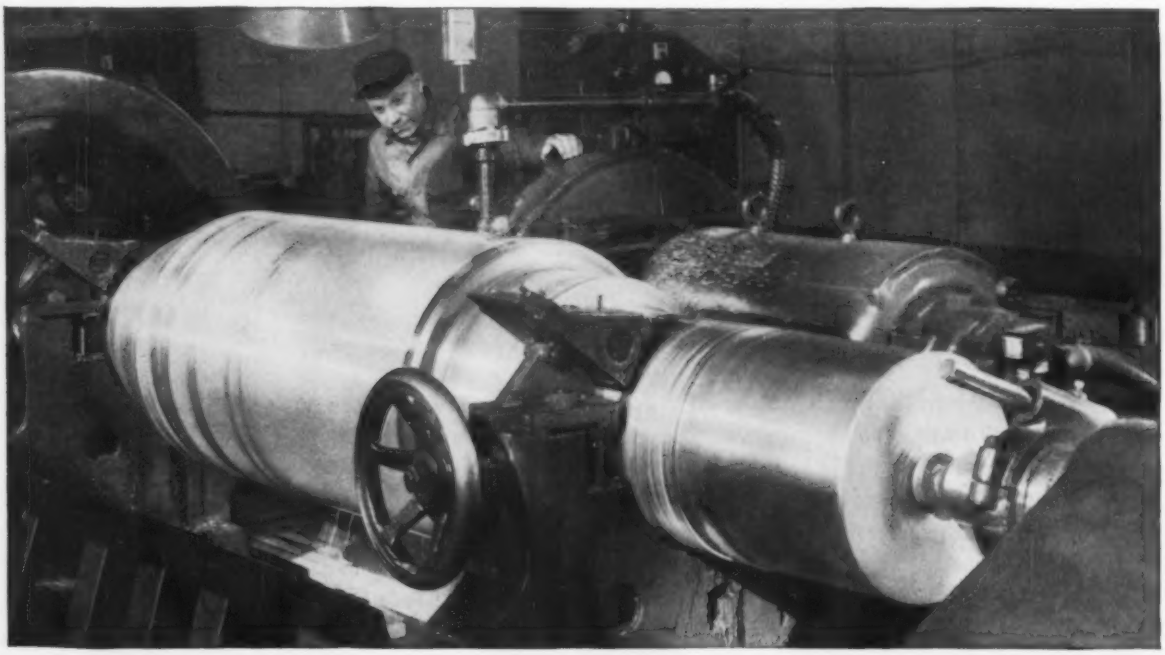
Labor and management must realize that higher wage costs followed by higher prices are causing dangerous inflation. Controls are not the answer: They treat only the effect. We must treat the cause!

Tom Campbell

Editor-in-Chief

PROGRESS IN ROLL MAKING

grinding of iron and steel rolls



NEW—

THIS PRECISION GRINDER recently installed at National is one of the largest available to the roll industry—60" x 24'. The addition of this modern precision tool better equips National's skilled craftsmen to meet exacting requirements for precision finishing of iron and steel rolls.

Installation of the new precision grinder is a part of the extensive expansion program at National. New furnaces, new machines, new plant additions—all reflecting the growth and vitality of a new National Roll & Foundry Division designed to provide the best in iron and steel rolls.

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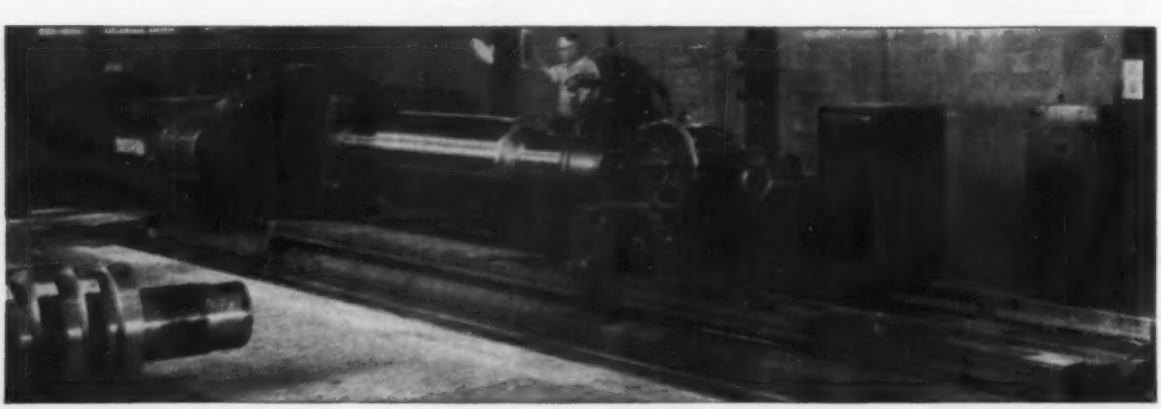

LETTERS FROM READERS

Spade Calling

Sir—Congratulations on your editorial of July 24 (A Spade Is a Spade) which gets right down to the guts of a major problem—our sliding foreign policy.—R. S. Morse, Pres., National Research Corp., Cambridge, Mass.

Sir—I enjoy all your editorials—think they are great—but was particularly impressed with the one appearing in your July 24 issue.—L. B. Worthington, Pres., Columbia-Geneva Steel, Div. U. S. Steel Corp., San Franciso.

Right to Work

Sir—I liked your special report on right-to-work legislation in the July 24 issue.

It would be appreciated if I could secure about four copies of this article. Particularly I desire to send a copy to the Republican candidate for governor.—J. J. Laudig, Research Eng., The Delaware, Lackawanna and Western Railroad Co., Scranton, Pa.

Standards

Sir—We read the article "U. S. Lags on World Standards" in your July 31 issue.

In it the International Organization for Standardization (ISO) is mentioned and we would appreciate knowing where headquarters of the organization is located — Juan Zapata, Vice Pres., Compania De Acero Del Pacifico S.A., Chile.

▪ Seat of the ISO and the general secretariat is at 1, Rue de Varembe, Geneva, Switzerland.—Ed.

"Of course he was groomed for the job—he married the boss' daughter!"

Fog Control

Sir—Appreciated recent mention of your effort to keep IRON AGE de-fogged of excess wordage and your use of Robert Gunning as a readability consultant.

Congratulations! With business letters at least emerging from the "We are in receipt of your favor of the 22nd instant and in reply thereto beg to advise" form it is encouraging to know that trade papers are going to eliminate some of their verbosity.—A. J. Suiter, Pres. & Gen. Mgr., U. S. Supply Co., Kansas City, Mo.

SUB Plan

Sir—We note with interest your reference in the Aug. 7 issue to the variation of the SUB plan initiated by General Motors at its Inland Manufacturing Division Plant. We think it's a fine plan . . . we thought so as far back as Aug. 1956 when we presented — and Local 1036, United Steelworkers of America, accepted—our plan of unemployment and additional retirement and/or death benefit security which we have chosen to call USBF (Unemployment Savings Benefit Plan).

Under the plan the company has, for two years, contributed five cents for each hour worked towards a trust fund established for each man.

R. A. Coulter, Plant Supt., Molybdenum Corp. of America, Washington, Pa.

▪ Thanks for your letter. Just goes to show that there's nothing new under the sun.—Ed.

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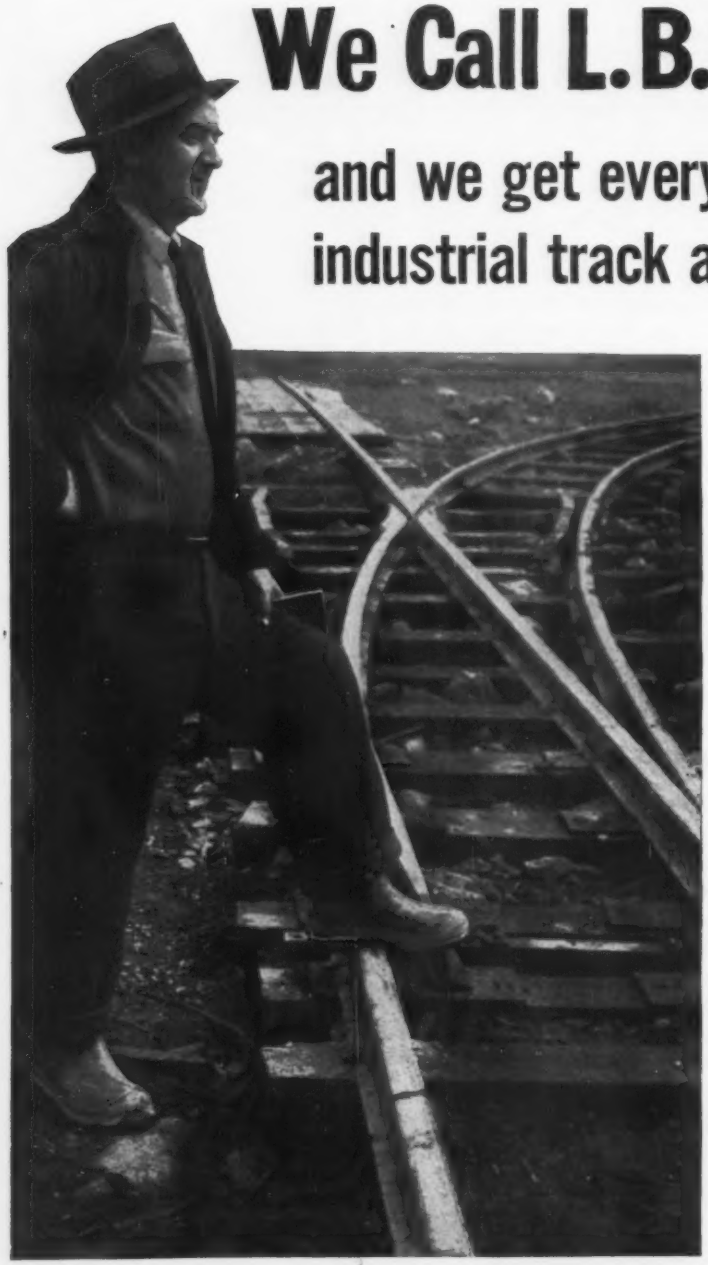

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Data on a Giant

That brawny hunk of metal in blushing technicolor on our cover is previewing our latest "How to Get More for Your Metalworking Dollar." The subject this time is forgings—carbon and low alloy steel.

There's a lot in this article which starts on p. 89 of this issue. Something, in fact, for the purchasing agent, the production man, the design engineer, and the metallurgist. Well, just consider some of the section headings — Guide to Forging Methods, Choice of Steel for Forgings, and Estimating Forging Costs.

But getting back to our cover hero. Here are the vital statistics as they say in Hollywood:

Type of forging: Shaft for a hydraulic turbine.

Maker: Bethlehem Steel Co.

Customer: S. Morgan Smith Co., York, Pa., for a hydro-electric power project on the Columbia River in Washington.

Raw Material Used: A 120-inch corrugated ingot weighing 476,500 lbs.

How Processed: Forged on a 7500-ton press to a main body diameter of 52½ inches.

Shipping weight: Sent out semi-finished machined at 140,000 lbs.

Shipping length: 21¼ ft.

Block That Servo!

Letter came in here last week from Culver Advertising, Inc., a public relations firm, with a correction for a news release previously sent us. Gives you a rough idea of the problems coming along in automation.

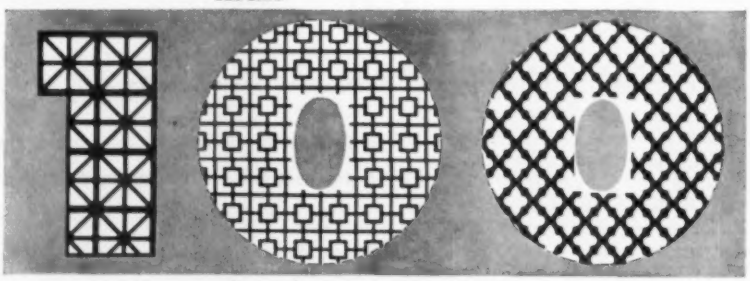
The letter admits having called the client's new device a "servo monitor (demodulator) preamplifier." But says it should have been called a "phase-sensitive demodulator preamplifier." Tsk, tsk!

Caught in the Act

The "white mouse" above was discovered by a General Electric lab technician searching for a saboteur in a steel alloy.

No ordinary little animal, the mouse who wasn't resulted when a crack in the alloy was photographed at a magnification of 100 times. The phantom rodent was shuttered for posterity by Levon Kacherian of GE's Aircraft Accessory Turbine Dept.

for
more
than



pleasing
patterns

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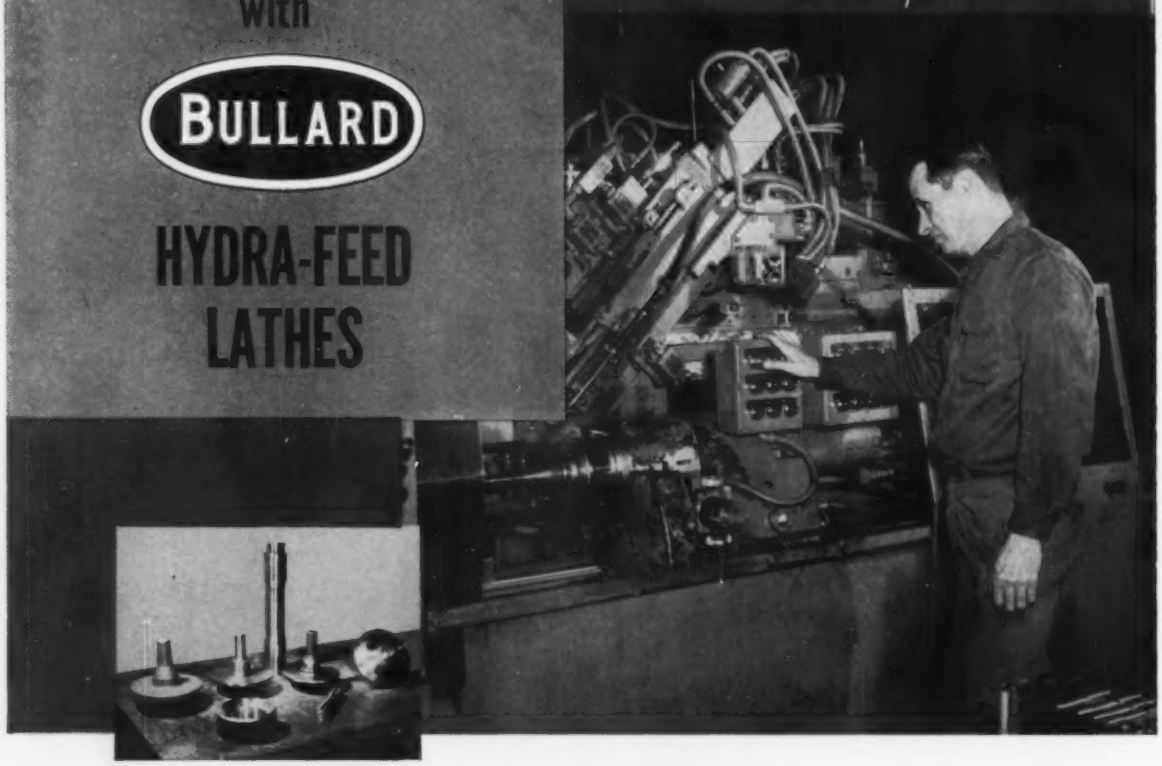
The experience of The National Supply Company, Toledo, Ohio, manufacturers of oil field machinery, as related by Mr. Owen U. Trumbull, Tool Engineer, can be applied to improve your profit picture.



Their BULLARD HYDRA-FEED TRACER LATHE . . .

- ★ Replaced four machines previously used
- ★ Reduced machining operations from ten to four
- ★ Held work to closer tolerances
- ★ Decreased spoilage
- ★ Simplified tooling and set-up

These are all factors that have a direct bearing on profits

The BULLARD COMPANY

Bridgeport 9, Connecticut

Remember . . . to cut costs when cutting metal . . . Buy BULLARD

COMING EXHIBITS

Chemical Show—Sept. 9-12, International Amphitheater, Chicago. (National Chemical Exposition, 86 E. Randolph St., Chicago 1.)

Iron & Steel Show—Sept. 23-26, Cleveland Public Auditorium, Cleveland. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22, Pa.)

Western Tool Show — Sept. 29-Oct. 3, Shrine Exposition Hall, Los Angeles. (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

Packaging & Materials Handling Show—Oct. 14-16, Coliseum, Chicago. (SIPMHE, 327 LaSalle St., Chicago 4.)

Metal Show — Oct. 27-31, Public Auditorium, Cleveland. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Plastics Show—Nov. 17-21, International Amphitheater, Chicago. (The Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.)

MEETINGS

SEPTEMBER

National Petroleum Assn.—Annual meeting, Sept. 10-12, Hotel Traymore, Atlantic City, N. J. Society headquarters, Munsey Bldg., Rm. 958, Washington, D. C.

The Malleable Founders Society—Semi-annual meeting, Sept. 19. Hotel Cleveland, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland 14.

Steel Founder's Society of America—Fall meeting, Sept. 22-23, The Homestead, Hot Springs, Va. Society headquarters, 606 Terminal Tower, Cleveland 13.

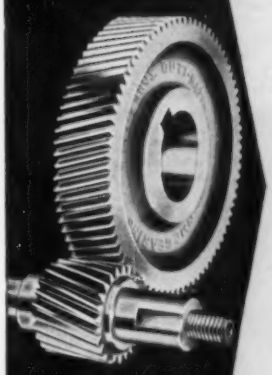
The Material Handling Institute, Inc.—Joint industry fall meetings—Sept. 22-24, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, Suite 759, One Gateway Center, Pittsburgh 22.

(Continued on P. 16)

PREMIUM GEARING
at Production-Run Prices

Foote Bros. Offers Engineered Helical and Worm Gear Sets FROM STOCK

1638 Duti-Rated COMBINATIONS



IN STOCK:

*Horsepower Ratings....1 to 200**
*Center Distances.....2" to 12"**

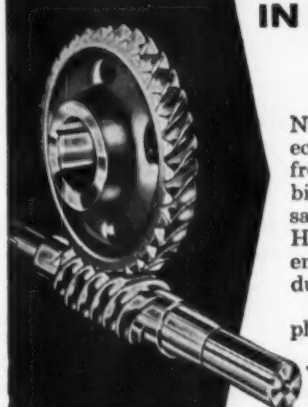
Check with Foote Bros. *before* you finalize that design. The chances are you'll find exactly what you need among the 1638 *stock* combinations of Duti-Rated Helical Gears.

When you buy Duti-Rated Gearing, you'll get more than best for your money . . . you'll get the benefit of thousands of engineering and development hours . . . and the unquestioned advantages of precision tooling and manufacturing methods. You'll get performance proven in countless Foote Bros. Line-O-Power and special drives, and Foote Bros. —Louis Allis Gearmotors. This is high hardness, accurate, balanced design gearing that will give you more load capacity and wear life per dollar.

**Larger sizes made to order from standard tooling.*

Write for DUTI-RATED catalog: Engineering Manual DR No. 2.

150 WORM GEAR COMBINATIONS



IN STOCK:

Horsepower Ratings....1 to 100†
Center Distances.....2" to 12"†

Need worm gear and worm sets? There is economy and convenience in choosing them from the many Foote Bros. worm gear combinations available from stock. This is the same gearing used in famous Foote Bros. HYGRADE Enclosed Worm Gear Drives . . . engineered, premium quality gearing at production-run prices.

Engineering Manual SW No. 1 has complete details. Write for your copy.

† Tooling available for larger worm gear sets, engineered, but not stocked, to 200 HP and 18" centers. Prompt deliveries.

ENGINEERING SERVICE

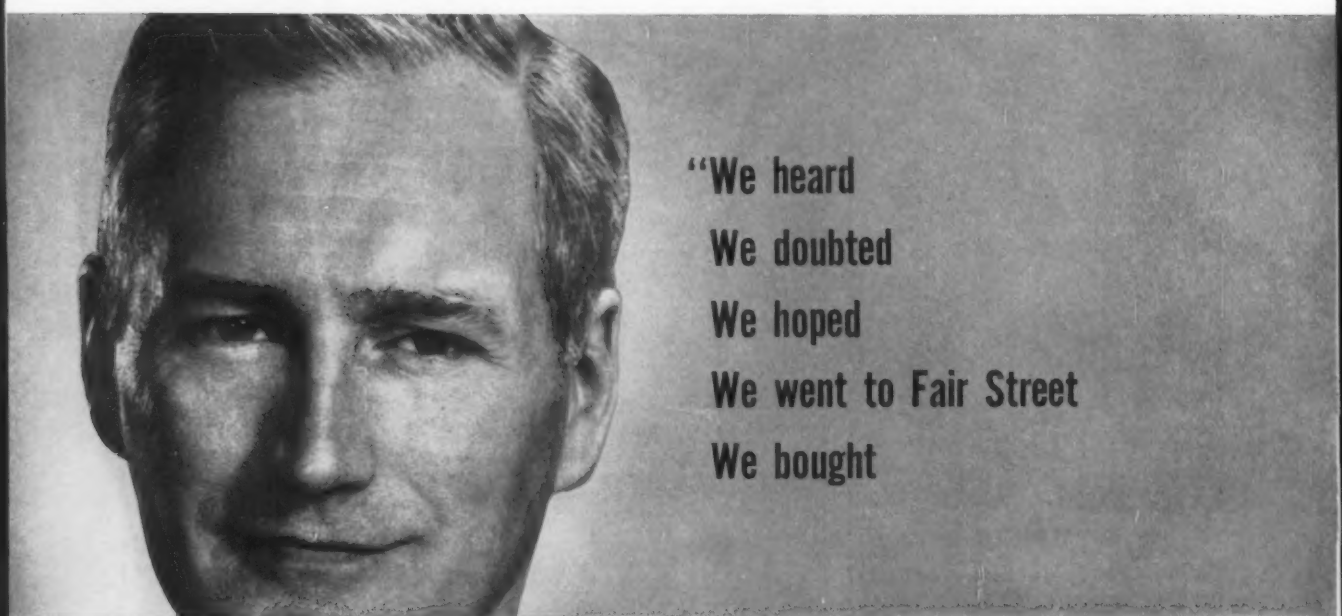
Let us help you select standard helical or worm gearing to meet your special requirements, or, let us design and build your complete unit. Place your gear problems in the hands of experienced power transmission and gear engineers. Your inquiry is invited, and there's no obligation.

this trademark stands for the finest industrial gearing made

FOOTE BROS.
Better Power Transmission Through Better Gears
FOOTE BROS. GEAR AND MACHINE CORPORATION
4545 South Western Boulevard, Chicago 9, Illinois

C. J. GANO, Vice-President & Plant Manager,
Speco Division, Kelsey-Hayes Co.

a man who came to Fair Street



"Two more DeVlieg JIGMILS rapidly followed the first. Continued proof of precision, speed and versatility caused us to buy an additional two machines.

With our JIGMILS we no longer use an expensive machine as a planning desk. We no longer build expensive boring fixtures. The JIGMIL Technique solves these problems and saves both time and scrap.

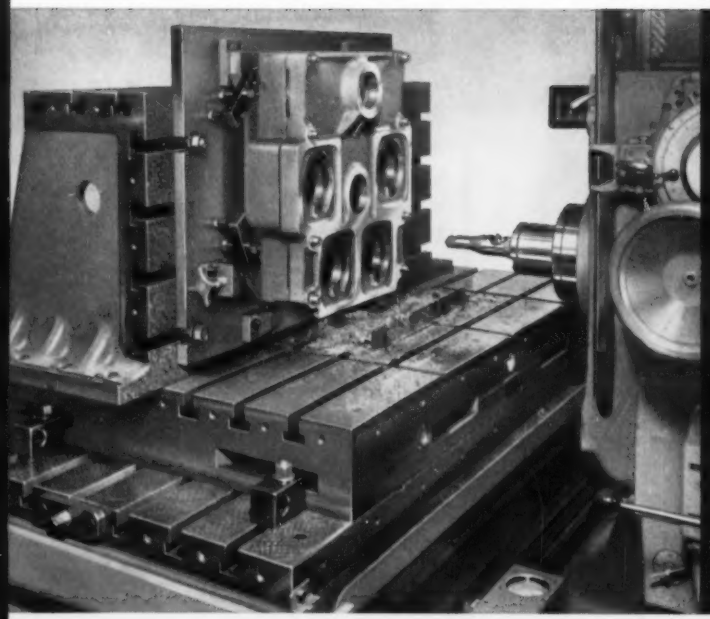
Our DeVlieg JIGMILS give us the versatility needed in our 'Overgrown Job Shop.' We can make prototypes with the same accuracy as tooled jobs and continue our production without expensive retooling and loss of time."

C. J. GANO

DE VLIEG MACHINE COMPANY, FAIR STREET • **ROYAL OAK, MICHIGAN**

SOME OF OUR JIGMIL USERS

Adams Div., LeTourneau-Westinghouse Co.
Akron Standard Mold Co.
Allen Tool Corp.
American Machine & Foundry Co.
Andale Company
Baker-Perkins, Inc.
Bell Aircraft Corp.
Bendix Products Div. of Bendix Aviation Corp.
Bryant Chucking Grinder Co.
Buick Motor Div., General Motors Corp.
J. I. Case Co.
Cleveland Trencher Co.
Danroy Boring Co.
Daystrom Inc.
Denison Engineering Div. American Brake Shoe Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Emsco Manufacturing Co.
Evans Reamer & Machine Co.
Fairchild Engine & Airplane Corp.
Fenn Manufacturing Co., The
R. H. Freitag Mfg. Co.
Goodyear Tire & Rubber Co., Inc.
Halliburton Oil Well Cementing Co.
Heintz Div. Kelsey-Hayes Co.
Hughes Tool Co.



A FEW PROVEN ADVANTAGES OF THE JIGMIL TECHNIQUE

- Eliminates cost of expensive jigs and production delays resulting from their manufacture.
- Simplifies tooling.
- Employs automatic functions to reduce factors of human error even in close tolerance work.
- Makes possible greater flexibility of product design.
- Improves end product by permitting interchangeable assembly of parts without hand fitting.
- Increases production and product accuracy.

ACCURACY IS AN ECONOMY!

ANOTHER EXAMPLE OF JIGMIL PRECISION
applied to guided missile production

Speco Division, Kelsey-Hayes Co., uses the JIGMIL Technique to bore and mill to precise limits of accuracy a wide range of guided missile components such as the one above. Because of their speed, accuracy and versatility, Speco also uses its 5 JIGMILS in the production of such critical items as aircraft and helicopter transmissions, hydraulic control systems, radar antennas, rocket and jet engine precision gears and assemblies.

Improved Paper Machinery Corp.
McDonnell Aircraft Corp.
Mechanical Specialties Co.
Michigan Drill Head Co.
Oil Well Supply Div. U.S. Steel Corporation
Paramount Boring & Machine Co.
Princeton University, Forrestal Research Center
Rheem Mfg. Co.
Sandia Corp., Sandia Base, U.S. Atomic Energy Comm.
Stanley Aviation Corp.
Teppert Tool & Eng., Inc.
Van Norman Machine Company
Wabash Mfg. Co., Inc.
Wiedemann Machine Co.
Worthington Corporation

Our newest catalog will help you decide. May we send it?

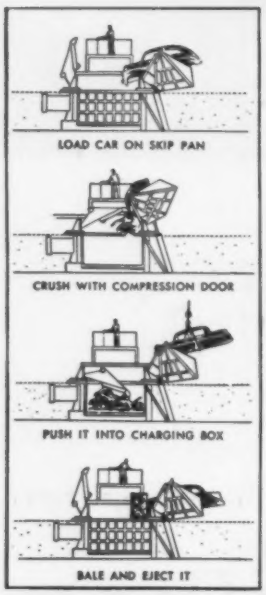
WILL YOU BE THE NEXT TO VISIT FAIR STREET

DeVlieg

SPIRAMATIC JIGMILS®

ACCURATE HOLES AND FLAT SURFACES IN PRECISE LOCATIONS

New Power-Packed "750-CS" ... Bales Car Bodies in Just 3 Minutes!



Low-Investment Balester Does Work of Bigger Presses.

In a feast-or-famine market, versatile equipment pays off! That's the reason for the new 750-CS which handles smaller scrap with unbeatable efficiency and bales car bodies at a pace only slightly off that of the big expensive presses. The powerful new "Ram-Pan Loader" with the curved bottom fits the arc of the compression door as it pushes the car down into the charging box, a pre-baling operation that takes less than a minute and reduces costly cutting or shearing work, all told, you've got a tight compact bale in *less than three minutes!* You'll like the many other new features of the 750-CS; write today for our new bulletin.

Mfd. By Dempster Brothers, Inc.

DEMPSTER BROTHERS, Dept. IA-8
Knoxville 17, Tenn.

WRITE TODAY
For New Bulletin on the 750-CS
Dept. IA-8

DEMPSTER BALESTER®

EXHIBITS, MEETINGS

(Continued from P. 13)

Air Moving & Conditioning Assn., Inc.—Annual meeting, Sept. 22-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 2159 Guardian Bldg., Detroit 26.

Porcelain Enamel Institute — Annual meeting, Sept. 25-27, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 1145 19th St., N. W., Washington, D. C.

The Electrochemical Society, Inc.— Semi-annual meeting, Sept. 28-30 and Oct. 1-2, Chateau Laurier, Ottawa, Canada. Society headquarters, 1860 Broadway, N. Y.

Pressed Metal Institute — Annual meeting, Sept. 28-Oct. 2, The Cloisters, Sea Island, Ga. Society headquarters, 3673 Lee Rd., Cleveland 20.

OCTOBER

National Assn. of Sheet Metal Distributors—Fall meeting, Oct. 5-8, Marlborough Blenheim Hotel, Atlantic City. Society headquarters, 1900 Arch St., Philadelphia.

Truck Body & Equipment Assn., Inc.—Annual convention and exhibit, Oct. 6-8, Ambassador Hotel, Atlantic City. Society headquarters, 1616 K St., N. W., Washington, D. C.

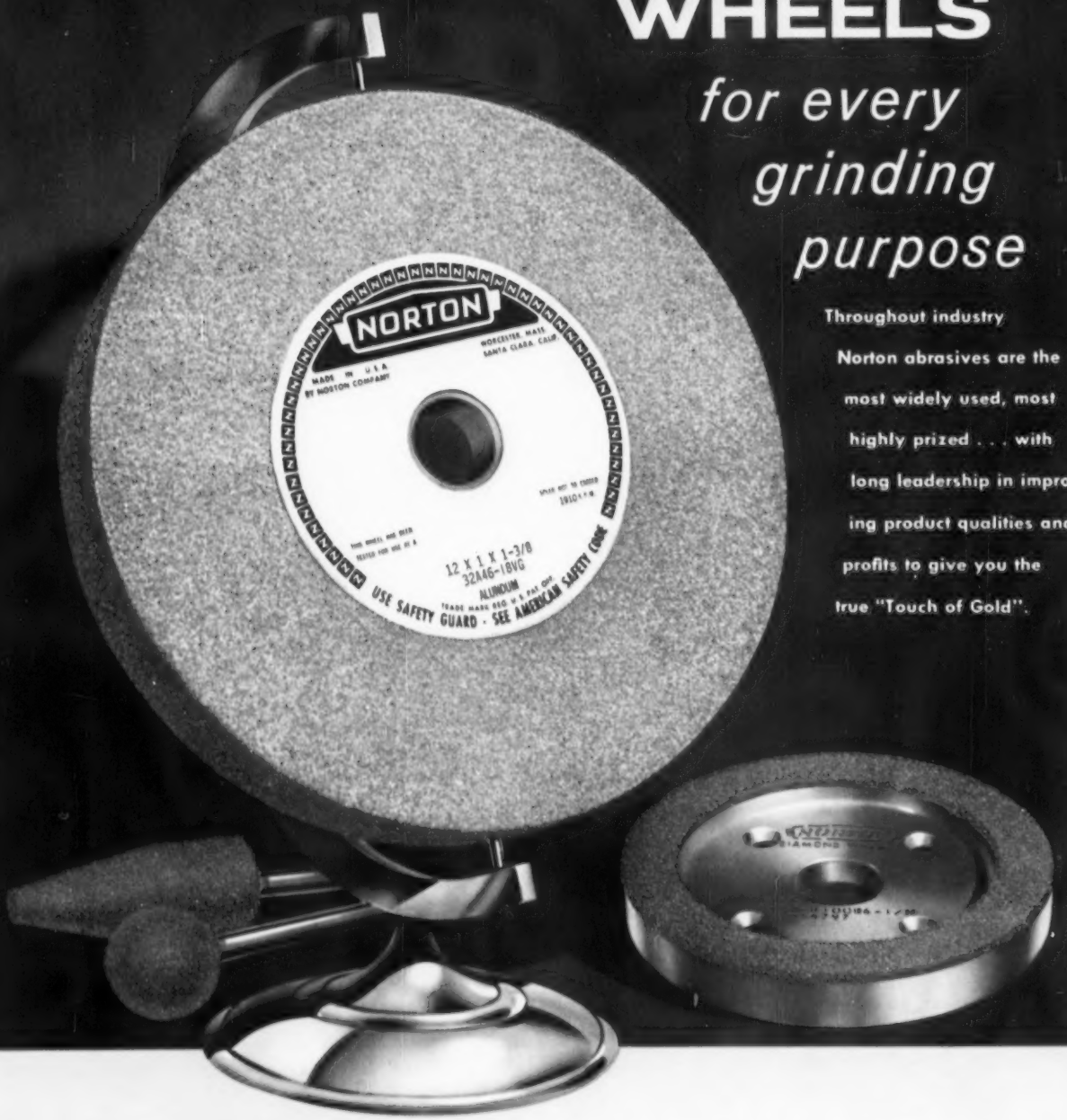
Gray Iron Founders' Society, Inc. —National annual meeting, Oct. 8-10, Sheraton-Park Hotel, Washington. Society headquarters, 930 National City-E 6th Bldg., Cleveland.

The Wire Assn.—Annual convention, Oct. 13-16, Chalfonte-Haddon Hall, Atlantic City. Society headquarters, 543 Main St., Stamford, Conn.

American Machine Tool Distributors' Assn.—Annual meeting, Oct. 15-17, Sheraton Plaza, Boston. Society headquarters, 1900 Arch St., Philadelphia.

Rail Steel Bar Assn.—Semi-annual meeting, Oct. 20-22, Blackstone Hotel, Chicago, Society headquarters, 38 S. Dearborn St., Chicago.

First in the **WORLD OF WHEELS** *for every grinding purpose*



Throughout industry Norton abrasives are the most widely used, most highly prized . . . with long leadership in improving product qualities and profits to give you the true "Touch of Gold".

Around the world and still expanding

Abrasive and Grinding Wheel Plants — Worcester, Mass.; Santa Clara, Calif.; Hamilton, Ontario; South Africa; England; France; Germany; Italy; Brazil.

Behr-Manning Plants — *Coated Abrasives and Pressure-Sensitive Tapes* — Troy, N.Y.; Canada; Australia; France; Northern Ireland; Argentina; Brazil.

Electric Furnace Plants — Huntsville, Alabama; Chippawa, Ontario; Cap-de-la-Madeleine, Quebec; Brazil.

Grinding and Lapping Machine Plant — Worcester, Mass.

Refractories Plant — Worcester, Mass.

Electro-Chemical Plants — Chippawa, Ontario; Huntsville, Alabama.

Norton Pike Plant — *Sharpening Stones* — *Stair and Floor Tile* — Littleton, New Hampshire.

Bauxite Mines — Bauxite, Arkansas.

General Offices: Norton Company, Worcester, Mass.

Headquarters for the "TOUCH of GOLD"

The world's largest source of abrasive research, manufacturing development, and service . . . all combining to aid your own production with improved grinding at lower cost.

BIG STEPS FORWARD Some of the latest and most important Norton developments—from top to bottom: a 32 ALUNDUM G-bond wheel, providing a unique aluminum oxide abrasive of outstanding performance plus the most advanced vitrified bond ever developed for precision, and semi-precision grinding . . . ALUNDUM TUMBLEX "S" bonded spheres for barrel finishing—spheres that get into areas where other shapes can't reach . . . A 44 ALUNDUM wheel, the most sensational non-premium abrasive ever developed for economical grinding — both rough and precision. Advancements like these are typical of the more than 200,000 different types and sizes of Norton abrasive products that cover every modern grinding job.

SELECTION IN ACTION For ordinary grinding jobs the vast amount of Norton know-how literature tells you how to select exactly the right wheels, while the many Norton films show the best grinding methods. But you may have new, unusual problems. Then, your distributor's Norton factory-trained specialist by studying your jobs can help you find the right solutions in quick time. And if necessary, he'll call in your regional Norton Abrasive Engineer for additional technical advice. With experts like these, the grinding wheels you need will be proved in action—on your machines.

DISCOVERING MUCH MORE Norton laboratory researchers, numbering over 180 scientists and technicians, are constantly seeking to find out a great deal more about abrasives and grinding wheels. Their chief interest is in developing new abrasives, new abrasive products and improved grinding techniques. Their many successes in research of this nature have stepped up grinding progress to lower your grinding costs.

THE RIGHT WHEELS ARE RIGHT AT HAND Your Norton distributor is careful to keep his stocks fully adequate to meet all needs of his area. That's true, too, of the stocks in the five big, strategically located Norton branch warehouses — in the Norton California plant — and of the gigantic stocks at Worcester in "Norton City" — the world's largest grinding wheel plant, Headquarters of the "Touch of Gold."

NORTON ABRASIVES

Making better products . . . to make your products better

NORTON COMPANY • WORCESTER, MASS.

District Offices: Chicago* • Cleveland* • Detroit* • Hartford • Los Angeles Area (Huntington Park) • New York Area (Teterboro, N.J.) • Philadelphia* • Pittsburgh* • St. Louis

**Warehouse Facilities and Stocks at this location*

Plants and distributors around the world

BEHR-MANNING CO., Troy, N.Y. is a division of Norton Company

NORTON PRODUCTS
Abrasives • Grinding Wheels
Grinding Machines • Refractories
Electrochemicals

BEHR-MANNING DIVISION
Coated Abrasives • Sharpening Stones
Pressure-Sensitive Tapes

4-58

102,000 lbs. of steel was unloaded, sorted and stockpiled in one hour with the help of this American 300 Series Self Propelled Crane. A complete line of American Cranes and Excavators provide fast, maneuverable, versatile materials handling equipment for every application.

Working a clamshell bucket is just one of many jobs American DiesELectric Locomotive Cranes handle with cost-saving efficiency. This self contained crane will also work with hook, magnet, orange peel or grapple fronts —has ample power to switch railroad cars, too!

TRIGGER FAST AIR CONTROLS BOOST CRANE'S OUTPUT 20%

Fast, highly responsive air controls actually increase the daily production output of big American DiesELectric* Locomotive Cranes by 20%! Leading firms in the country's heavy industries have swung to American for their volume materials handling jobs. These cost-conscious firms have learned that the American's patented diesel-electric power system cuts operating costs sharply. Electrically driven trucks provide smooth switching and car spotting power while reducing maintenance costs up to 50%! Dependable diesel power on the machinery deck results in low cost materials handling power.

A variety of fronts . . . hook, clamshell, magnet, orange peel or grapple . . . provides every industry with a versatile, heavy duty, high production machine that will pay for itself in a hurry.

If you're interested in boosting handling volume while trimming costs, investigate American's new concept in crane design—the DiesELectric Locomotive Crane! Specifications on this complete line offering capacities from 25 to 130 tons are available immediately by writing:

*trademark

EXCAVATORS-CRANES to 2 yds.-50 tons
LOCOMOTIVE CRANES to 130 tons
DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

A limited number of locomotive cranes available for rental service

In *Ford* Farm and Industrial Tractors...

REPUBLIC DIE-FORM CUTS PTO COUNTER-SHAFT COST

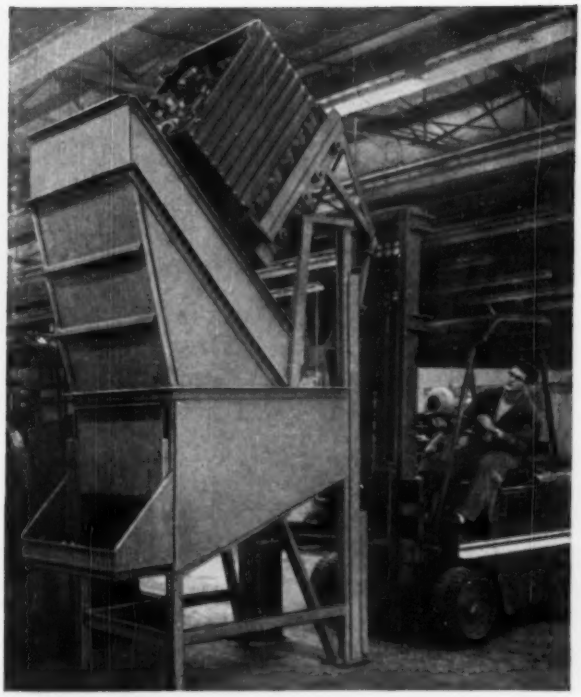
FORD TRACTOR POWER TAKE-OFF COUNTER-SHAFT costs less to produce using a Republic Die-Form blank, as compared with previous materials. Shown below are blank (top) and complete shaft (at bottom). Use of Die-Form blanks may enable you to produce a superior part for less money. Clip and send coupon for facts.

By using Republic Die-Form blanks to produce power take-off counter-shafts, Ford engineers gain substantial production economies. Because they closely approximate the completed part, Die-Form blanks minimize required machining and reduce handling costs for raw material and scrap disposal. In addition, the nature of the Die-Form Process actually improves machinability of any given steel analysis, permitting further savings through use of higher speeds and feeds.

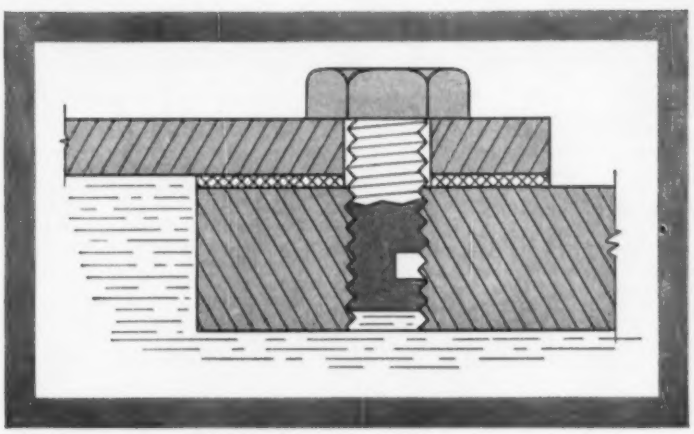
The Republic Die-Form Process is a cold work operation performed by forcing one or more sets of dies over each end of a hot rolled steel bar. Resulting multi-diameter bar, in addition to the cost-saving advantages outlined above, offers improved yield and ultimate strength. Diameters are accurate to within .005 inches which may, in some cases, entirely eliminate further finishing.

If you mass produce multi-diameter machine shafts it will pay you to investigate the savings potential of Republic Die-Form. Your nearest Republic office can provide details. Or write for Die-Form Folder ADV-746.

REPUBLIC ELECTRO PAINTLOK ASSURES TROUBLE-FREE PERFORMANCE for this unique, fully-automatic trap produced by the Self Sett Mouse Trap Company, Cleveland, Ohio. Electro Paintlok® proved superior to all other sheet products tested by Self Sett in meeting combined requirements for economy, formability, paint adherence, and corrosion resistance. Thanks to Electro Paintlok, trap life is expected to exceed 20 years with normal care. Republic Electro Paintlok offers all these advantages for your product. Send for facts.



REPUBLIC BOX AND SKID UNITS PERFORM FOUR JOBS, CUT HANDLING COSTS 10% at Dresser Industries' new pipe fittings plant at Wellsboro, Pennsylvania. Four functions are: (1) delivery of semi-finished parts to production stations; (2) feeding parts to machines via special hoppers; (3) receiving finished parts; (4) storage for shipment. In addition to immediate cost savings of 10%, Republic's rugged, corrugated steel construction assures years of minimum maintenance service. Send for data on Republic Materials Handling Equipment.



LIQUID SEALING PERFORMANCE is an added benefit of Republic Self-Locking Nylok® Bolts. As shown here, the nylon pellet in compression tends to expand and interrupt space between non-loadbearing surfaces of mating threads when bolt is wrenched tight. Fluid escape along helical thread path is blocked. Nylon pellet resists aging, moisture, and ordinary solvents to provide a long-lasting seal. Send coupon for information on all the benefits of Republic Nylok Fasteners.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. IA-5633
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

☐ Please send Republic Die-Form Folder ADV-746
Please send more information on:
☐ Materials Handling Equipment
☐ Nylok Fasteners ☐ Electro Paintlok Sheets

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

(Advertisement)

letters from production men . . .

Thread grinders serve as research tools

The versatility of Jones & Lamson Thread Grinders is hardly tested in the conventional production of hobs, taps, gages and threaded parts. In our toolroom, using the thread grinder as a basis for "Rube Goldberg" development we have produced precision racks, small form-profiled milling cutters, oil grooves and grinding wheel crushers.

While serving the purpose as a necessary piece of equipment, it also provides a platform from which solution-seeking thoughts may be launched in determining many additional production problems. The application of the thread grinder to toolroom problems is putting the best foot forward in achieving quick, accurate and dependable shop accessories.

— Production Specialist —

One machine replaces three

Our Jones & Lamson #5 turret lathe equipped with tracing attachment is doing the work formerly done by three conventional turret lathes. This Jones & Lamson machine does the rough and finish bore on a 6.5 diameter, 10.0 long magnesium ring. There are nine bore diameters, eight shoulder dimensions, all held to close tolerances. The accurate repetition and smooth operation of this machine reduces operator strain and produces better parts.

In our operation, full utilization of machine tools is a must. We appreciate our Jones & Lamson in helping to attain these goals.

— Assistant Superintendent —

Not afraid of competition

When the bids and quotations are opened, it's the shop with the J & L tools that gets the business. J & L turret lathes are the backbone of our job shop. Over 80% of our work is composed of machining the various alloys of stainless steel. J & L's speed, feed, power and rigidity coupled with your rapid traverse makes it possible for us to undertake jobs that our competitors wouldn't think of attempting, unless they too have J & L tools.

The availability of a J & L factory trained representative is an intangible asset to us. There isn't another machine tool builder in our area that has this service so readily available. Time and again his courtesy calls, at no expense to us, have resulted in the solving of production problems.

— Owner —

Accuracy is a "must"

We have used Jones & Lamson equipment for 17 years. In the past six months I have been partly responsible for replacing some of the turret lathes. One feature that makes Jones & Lamson our choice is the versatility possible with the 5" chuck opening.

Our principal reason for choosing Jones & Lamson again is that its rigidity and accuracy can be thoroughly depended upon for internal and external boring. The satisfaction of knowing that the close tolerances required *will* be held is vastly important in the production of our aircraft parts, because it cuts to the minimum the spoilage and rejection of parts and manhour costs.

With our future program of jet aircraft and missiles, these factors are even more important than formerly. Close tolerances and the fitting of mated parts are an absolute necessity, and we feel sure that Jones & Lamson machines will give us quality and quantity of parts to meet our requirements.

— General Foreman —

Straight from the shoulder

I am a man that came up the longest and most interesting way. Apprentice, turret lathe operator, toolmaker, Sub Foreman, Turret Lathe Foreman, Gen. Foreman, Gen. Supt. and I think I know what I am talking about. I will tell you guys in plain shop language, the best damn feature of one of the finest turret lathes built, — now hold your breath. This is it. The J & L Preselector.

Features:

#1 The best design. Past, Present, and Future. You were right the first time. No design change.

#2 Ease of training apprentices and future supt's.

#3 Safe to operate. No broken backs or torn shop coats.

#4 Less motion than any other design. Means no wear, no maintenance, no down-time. Hours x man's time + burden = Dollars saved.

#5 No personnel problems, as long as you let them operate the machine with the simple preselector.

P.S. We have saved 35% with our new #5 tracer.

— General Superintendent —

The lady has a point

When we order Jones & Lamson machinery, my desk is never cluttered with unnecessary paper work. The precision, durability, and dependability of your equipment keep repairs and breakdowns to a minimum, thus saving precious time and tedious work.

Jones & Lamson machinery is help we can rely on with confidence.

— Production Secretary —

A few words from Texas

Texas is predominantly an agricultural state, and as such, raises farmers and ranchers rather than mechanics. However, it is rapidly becoming an industrial state. But — and here is the catch — farmers and ranchers are not very good machine operators.

Short runs predominate in our industry, and short runs call for turret lathes. The Jones & Lamson Hydraulic Tracing Attachment can make turret lathe operators out of farmers and ranchers in a very short time.

— Procurement Engineer —

No strain — no pain

The advanced progress in cutting tools has created a challenge to the machine tool industry. One of your answers is a heavier headstock, a heavily ribbed bed, and a rigid universal bridge carriage (supported on front and rear bed ways).

For instance: — Our new #9A-4½ J & L Saddle Type Turret Lathe performs a normally twenty minute operation in three minutes. Steel forgings (twenty inches in diameter) have one-half inch of stock removed from *both* O.D. and I.D. with a .015 feed and a spindle speed of 489 RPM. There is no sign of vibration under the strain nor does the machine falter.

"Rigidity" built into Jones & Lamson's equipment to permit a heavy cut at high speed is my answer to increased production.

— Mechanical Engineer —

Tough job made easy

The operation was rough turning cylinder barrels on a Fay automatic lathe.

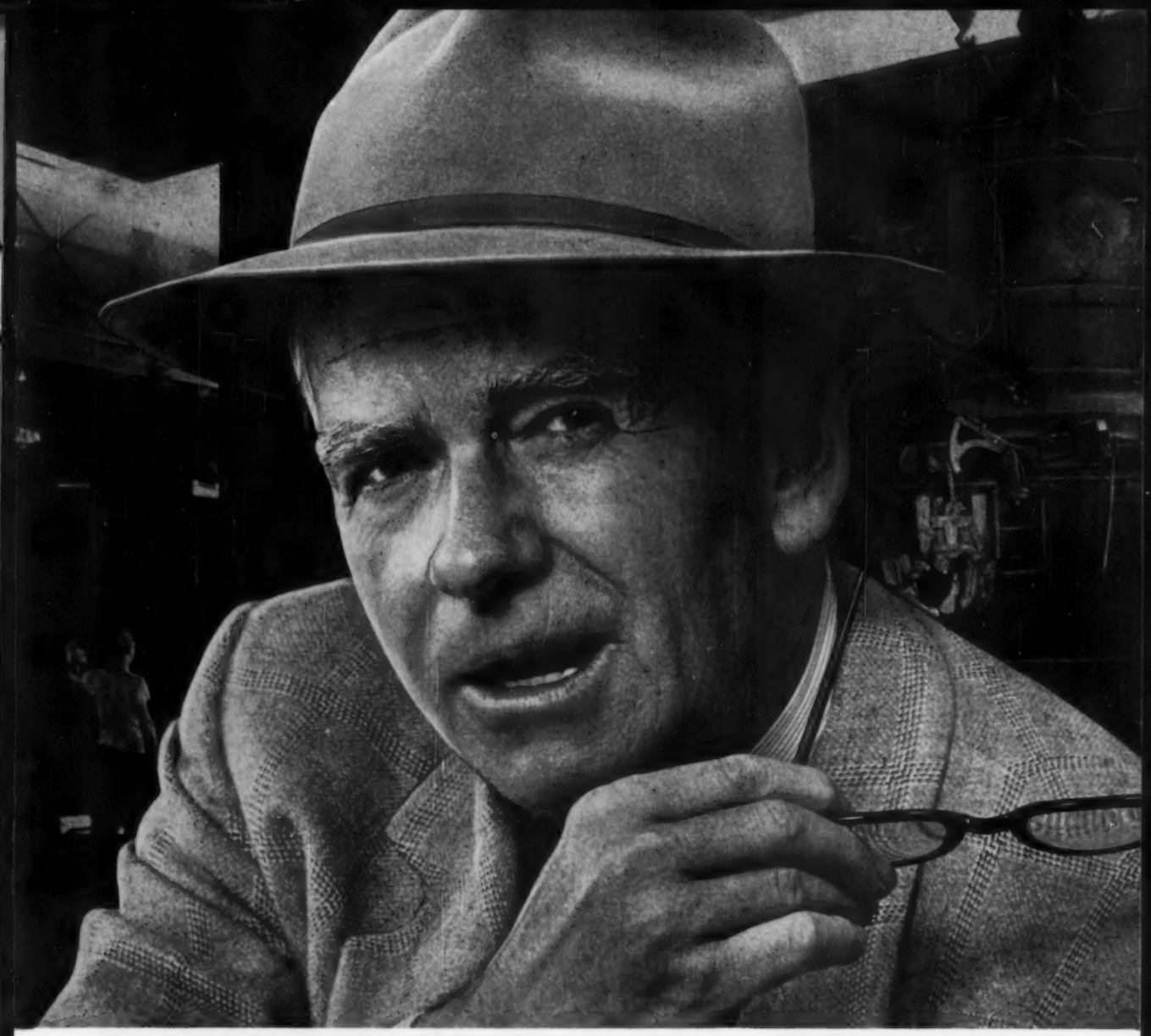
This machine had 2 sets of tool blocks with 2" square tool bits, one set feeding into the cut from the front and one set feeding into the cut from the rear. The material was Chrome Molybdenum steel, hot forged. We removed as much as 100 pounds of metal from this forging in less than five minutes. The cuts were 2" wide and about ¼" thick. It was a high production job, as there are twelve of these cylinder barrels to a motor. When the chips cooled, due to the heat generated in removal, they were a deep blue color. This was as tough a job as I have witnessed. This machine demonstrated the design and quality of Jones & Lamson lathes.

— Machine Buyer —

(names of these customers available on request)

. . . to Jones & Lamson Machine Company

511 CLINTON ST., SPRINGFIELD, VT.



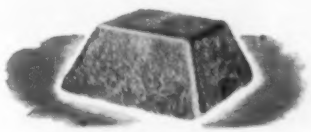
"I stock only one high-carbon chrome—refined charge chrome"

Steel mill and foundry operators are cutting chromium costs by using ELECTROMET's new refined charge chrome for all high-carbon chromium additions. Inventory, handling, and storage are greatly simplified by stocking only this one high-carbon chromium alloy. It is ideal for use as:

- **A base charge for stainless steels.**
- **Final additions for aircraft, bearing, and tool steels.**
- **Cupola or ladle additions for cast iron.**

Refined charge chrome combines the economy of regular charge chrome with the maximum cleanliness and low residual element content of conventional high-carbon ferrochrome. For facts on how refined charge chrome can reduce your costs, contact your ELECTROMET representative.

ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.



Convenient 20- and 40- pound pigs of refined charge chrome are magnetic, allowing easy handling with an electromagnet.

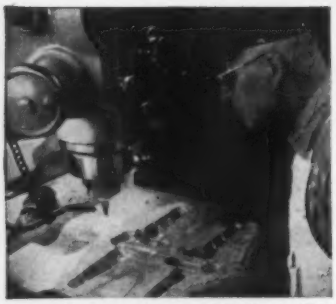
Electromet
FERRO-ALLOYS AND METALS

UNION CARBIDE

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Interstate Drop Forge Company—

20 Years a Cities Service Customer and Still Forging Ahead!



The modern way to cut a die is typified by die sinking machine, one of many at Interstate Drop Forge Company. All die sinking machines are lubricated by Cities Service lubricants.

With production running at roughly 1000 tons per month, Interstate Drop Forge Company of Milwaukee is one of the largest forging concerns in the Wisconsin area and growing all the time.

An integral part of this growth story, Cities Service is proud to have filled Interstate's lubrication needs for the past 20 years.

Drop hammers . . . helve hammers . . . upsetters . . . forging rolls . . . shapers . . . automatic metal saws. These are but a few of the diversified machines lubricated by specially tailored Cities Service oils and greases.

Actually, in a plant of this type with so many differing pieces of machinery, it would be possible to have as many as 25 different lubricants. But, Interstate, with the aid of their Cities Service Lubrication Engineer has been able to standardize on twelve Cities Service lubricants.

Streamlining . . . standardizing . . . improving. These are some of the services a Cities Service Lubrication Engineer can render for your operation, too. Ask him to make a free lubrication survey of your plant. Call the nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

sure it's big

. . . but not particularly big or unusual in Carlson's production of stainless steel plate

IT was normal, but not easy, for Carlson specialists to handle this big plate. Type 304-L stainless, it measured 7/16" x 131 1/2" x 452 9/16" and weighed an impressive 7923 pounds. And when this big one landed at the customer's receiving dock it was *exactly* what he wanted . . . *right* by chemical composition, *right* by physical standards, *right* to specification and *right* to size.

Whatever you need in stainless steel—big plates, small rings, formed or cut-to-shape items—will be produced accurately and on time. Stainless steel is our *only* business, and we know it. That is why you can depend on Carlson to give you *what you want when you want it!* Your inquiry is invited.

G.O.CARLSON *Inc.*

Stainless Steels Exclusively

120 Marshalton Road
THORNDALE, PENNSYLVANIA
District Sales Offices in Principal Cities

C

PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS AND SHEETS (No. 1 Finish)

LOOKING FOR MORE FROM

For steelcutting . . . trim costs with Carboloy® Extra-Performance Grades 330, 350, and 370, and low-cost, General-Purpose Carboloy 78 and 78B carbides

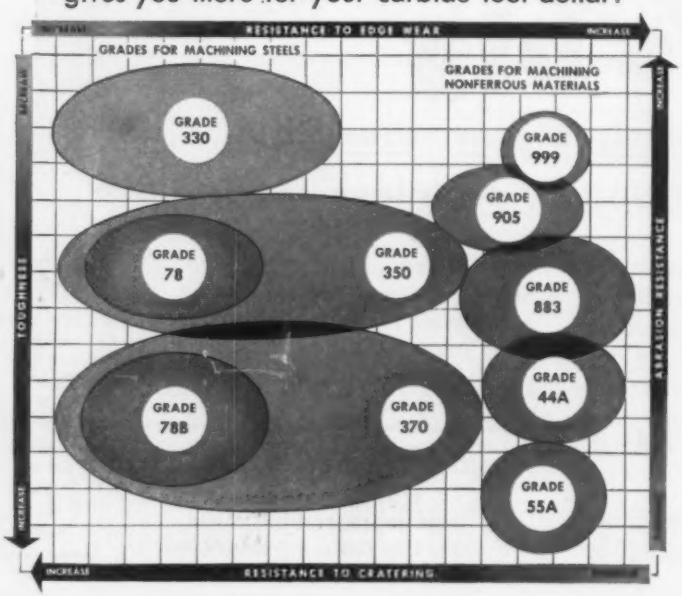
Some steelcutting jobs call for extra-tough, extra-performance carbides. Others can only be handled profitably with low-cost, general-purpose carbides. That's why we make them *both*.

Where you need increased machine productivity and have long production runs to keep cost-per-piece low—use Carboloy Extra-Performance Series 300 carbides. Their added strength and stamina handle jobs ranging from heavy roughing to high-speed finishing . . . at a unit cost and rate no "premium" carbide on the market can beat.

But, for general-purpose steelcutting jobs that don't require the Extra-Performance carbides, use Carboloy Grades 78 and 78B. Their top-notch performance, at low initial tool cost, will keep your machines operating profitably.

Chances are, your plant should be using *both* grades. Your local Authorized Distributor of Carboloy cemented carbides can deliver tools, blanks and inserts you need . . . in a hurry.

This complete team of Carboloy cemented carbides gives you more for your carbide tool dollar!



YOUR CARBIDE TOOL DOLLAR?

For nonferrous materials . . . boost production rates with Carboloy® cemented carbides performance-matched to your machining jobs

Aluminum, titanium, super alloys, wood—all have machining peculiarities that raise cain with production schedules and tool costs. That's why we make *five* job-tailored Carboloy cemented carbides for cutting these materials.

With these five grades (see chart, at left), you can get the one with exactly the right combination of shock resistance and wear resistance to match your job—whether heavy, interrupted cuts, or precision finishing.

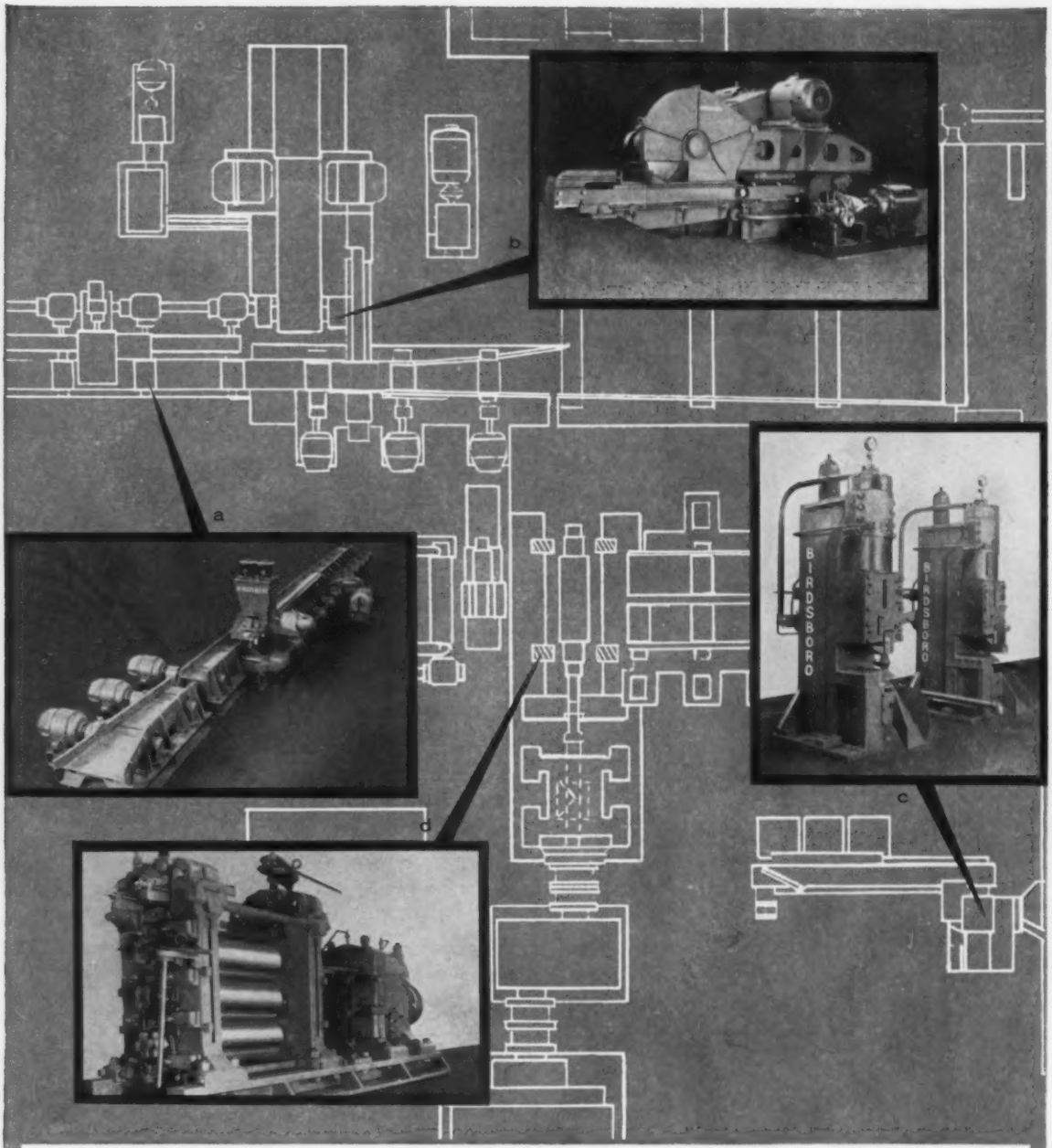
Because you're using performance-matched carbides with consistent metallurgical quality, you can schedule heavier production loads . . . and you will get this increased output at lower tool-cost-per-piece.

Your local Authorized Carboloy Distributor has complete stocks of tools, blanks, and inserts in these five grades. A phone call to him today will get your machines humming faster tomorrow.

For more information on Carboloy Extra-Performance and General-Purpose carbides, or nonferrous material carbides, write: Metallurgical Products Department of General Electric Company, 11153 E. 8 Mile Street, Detroit 32, Michigan.

CARBOLOY®
CEMENTED CARBIDES

GENERAL ELECTRIC



New production economies **start** *at the design stage . . .*

At Birdsboro modern design-engineering helps you attain the production economies you want on the job. That's why we place such importance on the idea stage of every job, and why we can sell "not just machines, but ideas, too." You'll find many competitive advantages in talking to Birdsboro when your next mill machinery job goes into the works.

Main Office, Engineering Department and Plant: Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

Illustrated above is a portion of a completely integrated Birdsboro merchant bar mill.

a. 54" Hot Saw Gauge b. 54" Hot Saw
c. 100 ton Crop Shears d. 16" 3-Hi Mill Stand

BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

"WEIRKOTE'S ZINC COATING STAYS SKINTIGHT. NO PEELING OR FLAKING—CAN ELIMINATE DIPPING OR PLATING AFTER FABRICATION!"

Q. Sure, but what happens on the tough jobs—like deep drawing or crimping?

A. You can work Weirkote right to the limit of the steel itself. And as I said, no peeling or flaking.

Q. Then where's the miracle? We tried galvanized before. And it struck out. Too much trouble, too much cost fixing it up after fabrication.

A. No miracle. It's just that Weirkote's made by the continuous process which integrates zinc and steel so that the toughest fabrication won't break down the bond.

Q. That means then that Weirkote can eliminate the need for plating or dipping to assure uniform corrosion protection for the most intricate part . . . is that the picture?

A. Yes, that's exactly the picture . . . and besides, Weirkote is now treated to inhibit wet storage (white oxide) stain.

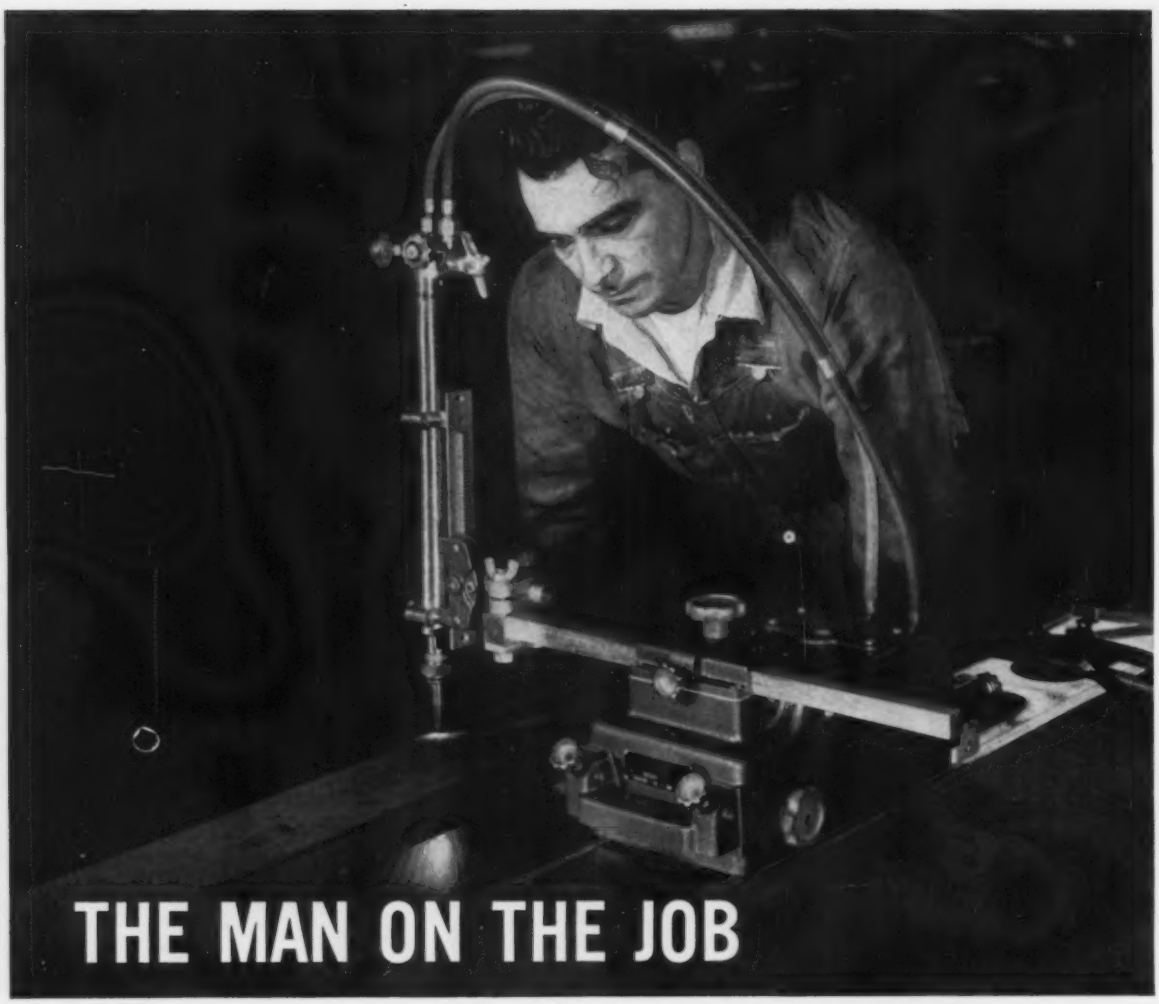
Send today for free booklet that details the time- and cost-saving advantages of using skintight zinc-coated Weirkote. Write Weirton Steel Company, Dept. A-8, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION



likes Victor Machine Torches and Tips

AND SO WILL YOU, because you get travel speeds from 0 to 180″ per minute, forward or reverse, with Victor's Model VU-120 portable flame-cutting machine. It cuts straight lines, circles, square or bevel kerfs with remarkable accuracy. Wide speed range enables you to adapt travel carriage to many automatic welding applications, using either submerged or inert arc.

HERE IT'S SHOWN cutting with a **new** LPCG machine cutting torch and tip — one of a **new** series designed to give maximum efficiency with natural and propane preheat gases. Remember, Victor torches perform best when you use genuine Victor tips.

For the torches and tips that cut your costs, call your Victor dealer.

VICTOR for welding

VICTOR EQUIPMENT COMPANY

Mfrs. of welding & cutting equipment; high pressure and large volume gas regulators; hardfacing rods, blasting nozzles; cobalt & tungsten castings; straightline and shape cutting machines.

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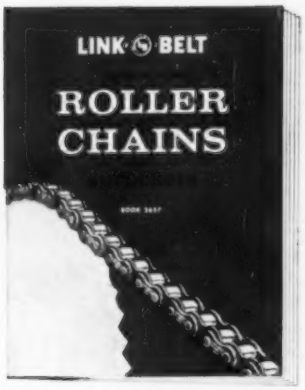
J. C. Menzies & Co., Wholly-Owned Subsidiary

NEW roller chain engineering data book



154-pages of application information, engineering data . . . sectionalized for easiest use

Not just another catalog, but an entirely new engineering handbook — the most comprehensive, easiest-to-use yet published on design and application of modern roller chain and sprockets.

Contains full data on the complete Link-Belt line of roller chain for both power transmission and conveyors . . . helpful application facts . . . new designs. Mail the coupon below for your free copy.

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Please send me a copy of the new Link-Belt Roller Chain Book 2657.

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14,353

How Warren Pouyer cut grinding

Six years as a tool and die maker gave Bay State's Warren Pouyer a basic knowledge of precise metal working problems that many an "expert" would envy. For the last nine years, he has specialized in abrasives and has gained a tremendously wide knowledge of grinding methods and materials.

Moog operator gets heavy, rapid stock removal using Bay State wheel to grind eye of automobile spring leaf.

costs 1/3 at Moog Industries

Too many wheels were being used up too fast. That was the basic problem in the spring eye grinding operation at Moog Industries, St. Louis, Mo. A leading manufacturer of truck, trailer and automobile springs, Moog makes a complete line of front-end, chassis parts . . . and in this highly competitive business, keeping grinding costs down is vitally important.

So they called in Warren Pouyer of Bay State distributor Mill Supply & Machinery Company and he spotted the trouble right off the bat: disc grinding wheels of a specification that looked as if it *ought* to be right but wasn't. Pouyer specified the proper Bay State wheel using a semi-friable type of aluminum oxide with a unique combination of grit sizes. Production increased 33% per wheel without loss of operation speed.

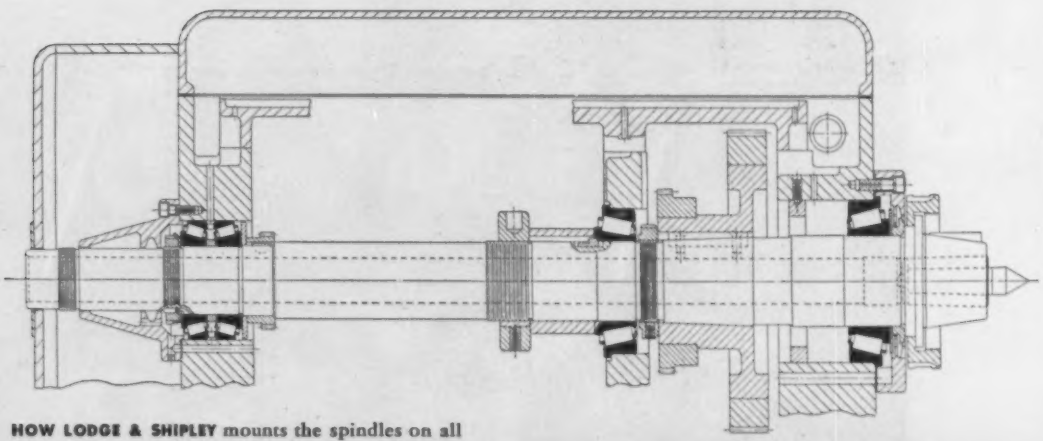
Since then, the Bay State wheel has been competitively tested over and over again and it has come out on top every time . . . a tribute to Warren Pouyer's ability to specify exactly the right wheel, in this case the first time, and to Bay State's ability to reproduce a given spec *exactly* and *consistently*.

Warren Pouyer doesn't solve all his grinding problems as quickly as this. Like all Bay State representatives, he's trained to study every problem *thoroughly*. And whether a particular problem has a simple solution or a tricky one, you can be sure *your* Bay State man will stick to it until he works out a practical, economical answer. *Better grinding at lower cost—that is his business.*

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities.



HOW LODGE & SHIPLEY mounts the spindles on all 2013 Powerturn lathes including both 45° and 90° Copymatics on Timken bearings to get extra rigidity, maintain accuracy, reduce maintenance.

New type lathe ups production 200%, saves users an estimated $8,000 a year

...one secret—TIMKEN® bearings on the spindle

"Production increases as high as 200%"..."Overall savings estimated at $8,000 a year"—read user reports about the new 2013 Powerturn 90° Copymatic Lathe. One important reason for such exceptional results is that Lodge & Shipley mounts the spindle on Timken® tapered roller bearings. Timken bearings give it the vital extra rigidity and hold runout to the minimum needed for tracer accuracy.

How spindle is held rigid. Timken bearings hold the spindle in positive alignment. They take *both* radial and thrust loads in any combination, because of their tapered design. And because of full line contact between rollers and races, Timken bearings have extra load-carrying capacity.

Why heavy shocks are absorbed. Case-carburization of Timken bearings' rollers and races gives them hard, wear-resistant surfaces and tough, shock-resistant cores.

How friction is virtually eliminated. Timken bearings are geometrically designed to roll true. And they're precision-made to live up to their design. They run smoother—last longer.

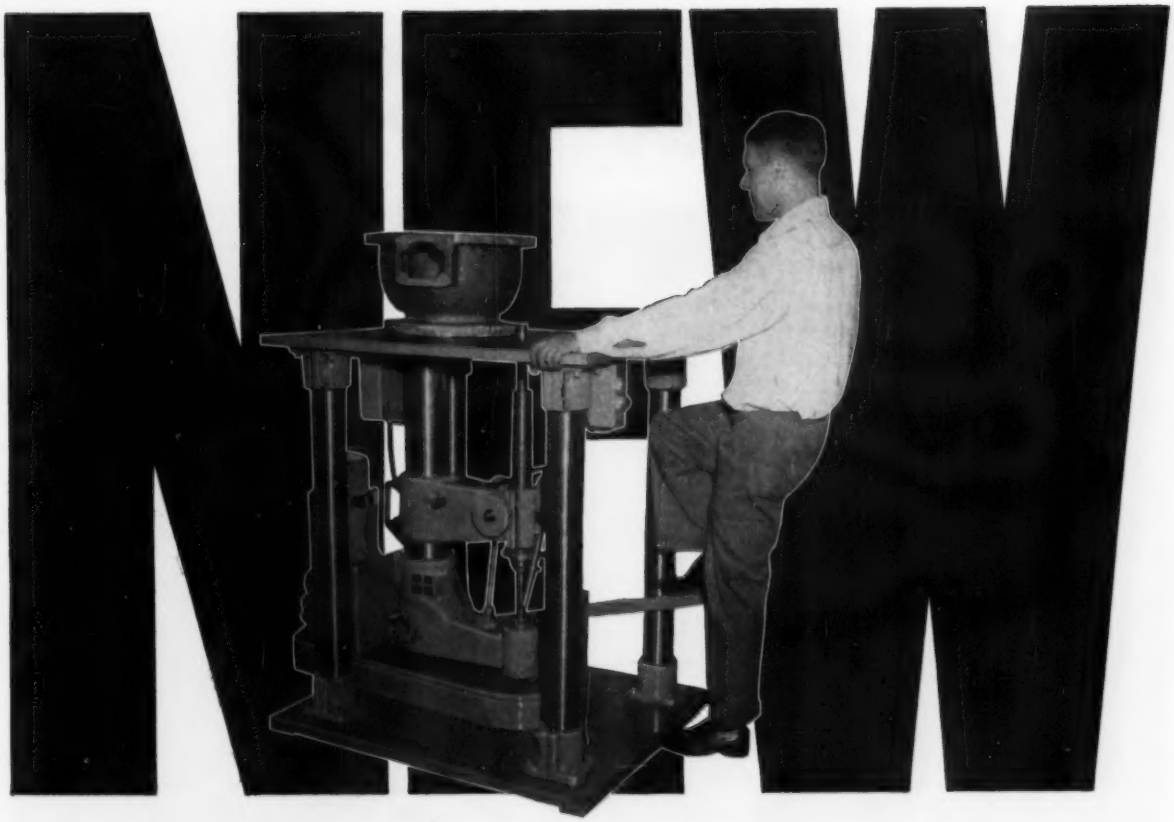
We even make our own electric furnace fine alloy steel, for extra quality control. We're America's only bearing maker that does. To get all these advantages, always specify bearings trade-marked "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD



"BUFFALO" BACK SPOT-FACER HANDLES 1000 LB. CASTINGS, AT PRODUCTION SPEED!

This heavy-duty "Buffalo" No. 22 Back Spot-facer is newly-designed for **fast** spot-facing of holes in flanges of large valve bodies, pump housings and other work pieces where it is impossible to spot-face a hole from the top. A rigid, ruggedly-constructed machine, it will spot-face to diameters up to 2½". Its large 36" x 43" table will handle castings weighing as much as 1000 pounds.

Three speed rates — 165, 255 and 400 rpm — are provided through a 2-HP, 350 rpm gear motor plus a C-section drive. The convenient foot treadle feed enables the operator to have both hands free to locate and hold the work. The spindle nose is bored for arbors with No. 4 Morse taper shanks, and the arbor can be locked in the spindle nose. Quarter turn, gunlock type cutters are recommended for use with this machine.

You can realize lower production costs with the "Buffalo" No. 22 Back Spot-facer. Contact your "Buffalo" machine tool dealer, or write for Bulletin 4078 today!

For Smaller Back Spot-Facing Operations on lighter castings, ask your "Buffalo" machine tool dealer about the "Buffalo" No. 18 Models A and B Back Spot-Facers. Or, write direct for Bulletin 3123.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

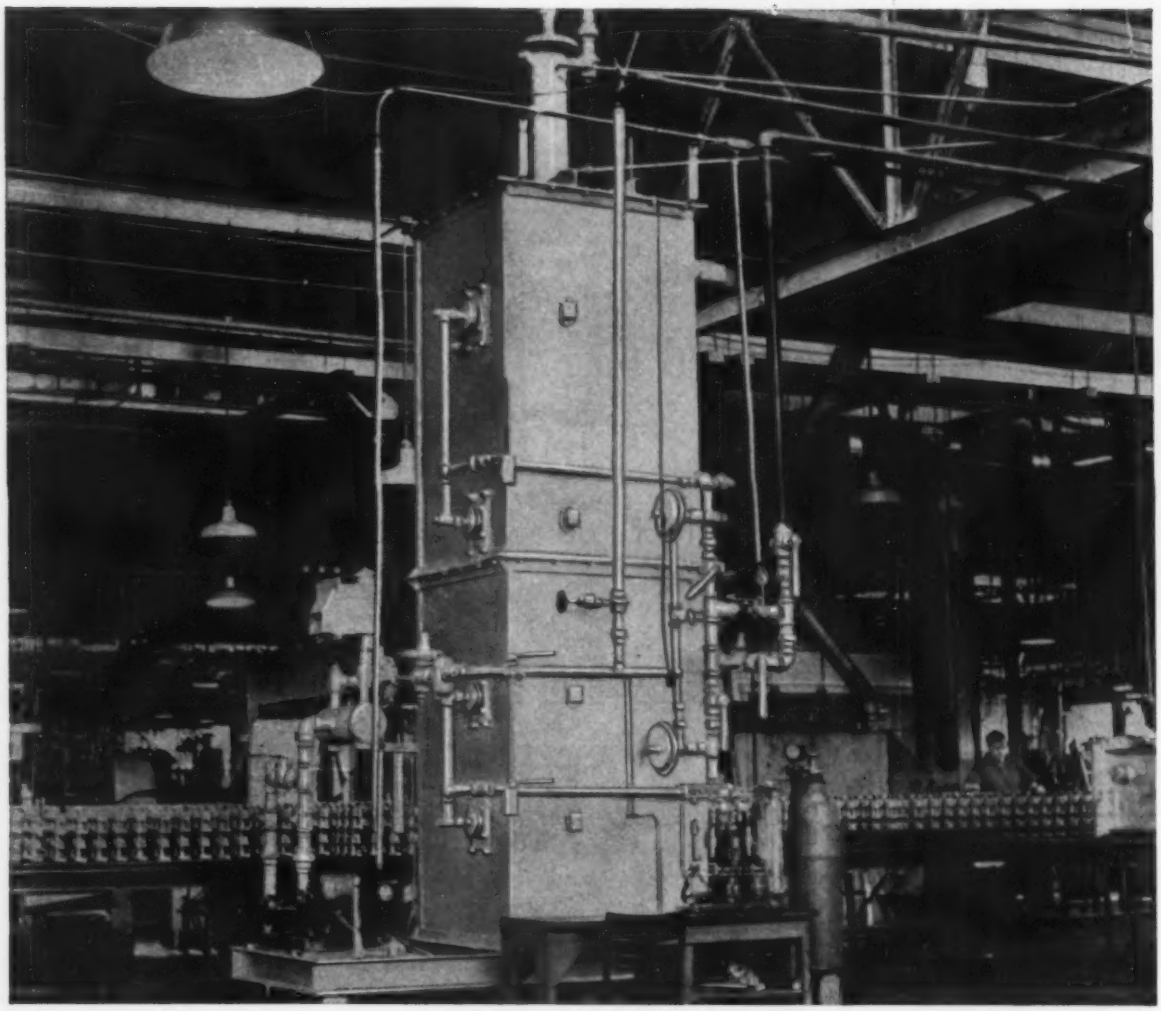
BUFFALO FORGE COMPANY

492 BROADWAY • BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING • PUNCHING • SHEARING • BENDING

1,800,000 cfh
of RX® generator atmosphere



That's the combined capacity of all the Surface RX® gas generators sold since this first one started operating April 4, 1941. This was the first practical catalytic gas generator for continuous bright gas carburizing . . . and it's still in use at Warner Gear Division, Borg-Warner Corp.

Such long-term reliability is only one of the reasons why so many plants standardize on Surface gas generators. Controllability, flexibility, turn-down operation, variety of gases and capacities are some of the other reasons. We'll be happy to tell you more about them.

Surface Combustion Corporation, 2373 Dorr St., Toledo, 1, Ohio. In Canada: Surface Industrial Furnaces, Ltd., Toronto, Ontario.

Surface®

wherever heat is used in industry

MAKE IT BETTER WITH METALS ..FOR LESS

Visit the METAL SHOW

CLEVELAND PUBLIC HALL
October 27-31

You can do it better with metals . . . for less, if you are up-to-the-minute on your metals know-how and know-why. Competition calls for the most efficient use of metals, equipment, processes . . . for correct design applications.

You can meet this challenge by attending the Cleveland Metal Show and Congress. You will see hundreds of operating production-saving displays. Metals, fabrication techniques, processing methods, testing and inspection – all these and more will be assembled in the vast Public Hall for your convenient inspection.

You will want to hear the scores of technical and practical sessions that ASM and the cooperating groups will present, featuring experts on new achievements in metals. In short, this is *your* event of the year in metals . . . you will use the ideas you pick up at the Metal Show all year long to save time and money for you and your firm.

Exhibitors: excellent space locations in this great "Metals Will Make It Better . . . for Less" Metal Show are available now – write or wire for details.

NATIONAL METAL CONGRESS and EXPOSITION

Owned and Operated by the **AMERICAN SOCIETY for METALS**
7301 Euclid Avenue Cleveland 3, Ohio

Cooperating Activities: Institute of Metals Division . . . Iron and Steel Division . . . Extractive Metallurgy Division of the American Institute of Mining, Metallurgical and Petroleum Engineers . . . Society for Nondestructive Testing, Inc. Associations presenting technical sessions in cooperation with ASM: Industrial Heating Equipment Association; Metal Powder Industries Federation; Metal Treating Institute; Special Libraries Association, Metals Division; and the extensive programs of the American Society for Metals with the new Bill Woodside Memorial Sessions, and ASM Metallurgical Seminar.

A Marion type 5760 stripping shovel in action. The dipper could fill two railroad cars in a single pass.

Farrel® gears take loads in stride on world's largest power shovels

Precision generation, combined with the use of highest-grade materials, give Farrel gears the ability to withstand the heaviest shock loads encountered in machine applications. The *backbone* in the gears—formed by the meeting of the two helices without a center groove—puts the entire face width of the gear to work. This pays off in extra strength and greater load-carrying capacity.

These are a few of the reasons why Farrel gears are "naturals" for the main-hoist drive in the largest power shovels ever built. Made by Marion Power Shovel Company, these giant machines have dipper capacities as high as 75 cubic yards.

Farrel engineers are available for help in working out unusual gear problems. Write today for further information.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

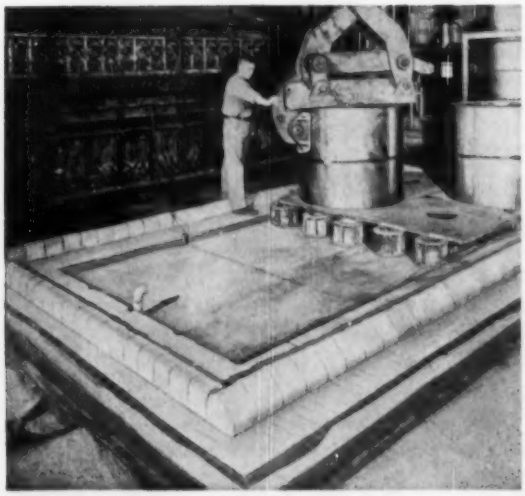
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Boston, Akron, Ann Arbor (Mich.), Chicago, Minneapolis, Los Angeles, Salt Lake City, Tulsa, Houston, Fayetteville (N. C.)
European Office: Piazza della Republica 32, Milano, Italy

Farrel-Birmingham®

FB-1150

Four-stack strip annealing furnace with a capacity of three 30,000 lb coils on a 34 to 36 hr firing cycle, 68 to 78 hr cooling, operating at a strip temperature of 1320 F in a 8.2% CO atmosphere. The base, 9" thick hearth and portions of the curb are cast of B&W Kaocrete-A.

B&W Kaocrete-A resists CO disintegration and sand penetration at Granite City Steel



B&W Kaocrete-A is cast in the hearths and curbs of these furnaces where firebrick refractory was previously used.

Granite City Steel states that both bases have been in use for over three years without any disintegration resulting from the CO atmosphere. In addition, the monolithic structure of this B&W castable refractory eliminates the destructive effects produced by sand penetrating the joints and cracks of firebrick hearths.

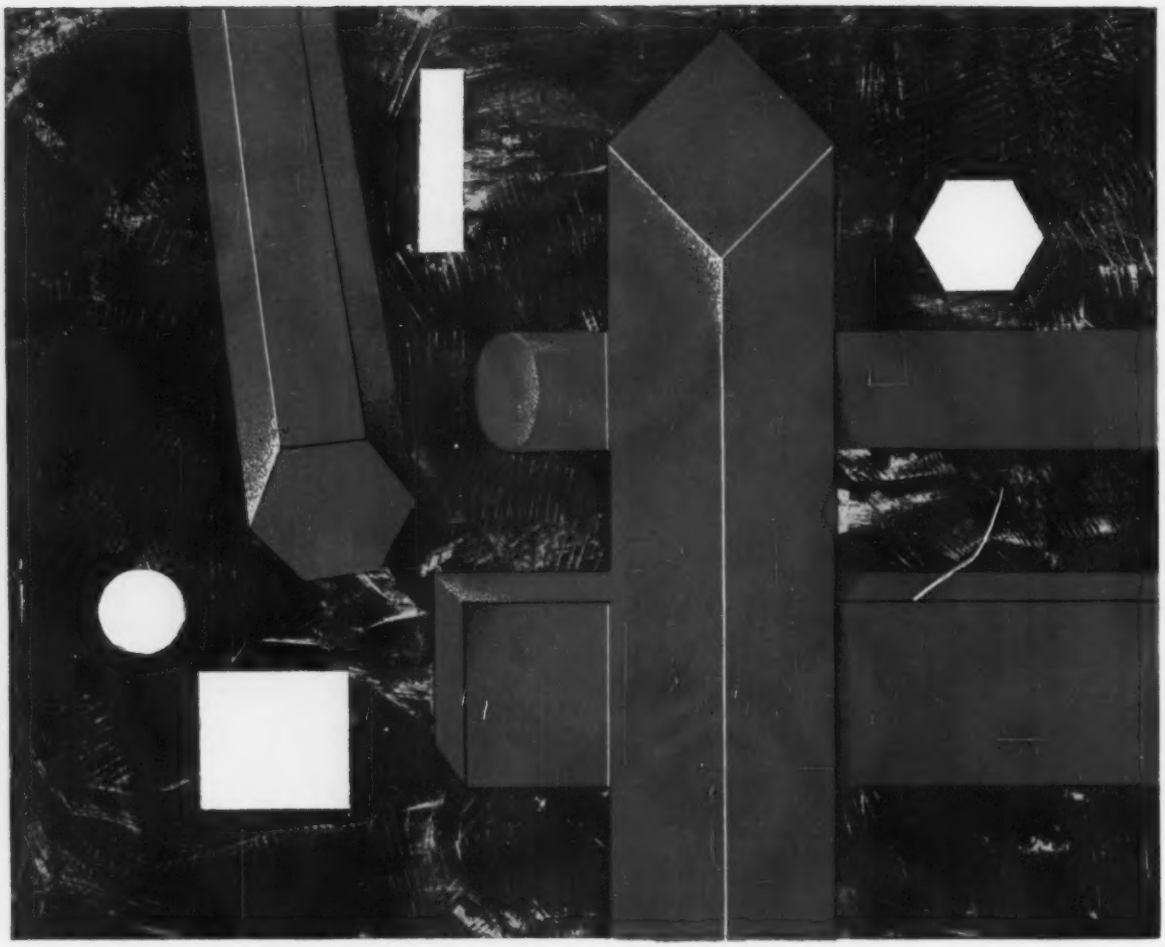
For further information on B&W's specialized refractory castables, write for Bulletin R-35.

Strip annealing furnace with a capacity of 70 to 80 tons per charge on a 24 to 48 hr firing cycle, 48 to 96 hr cooling cycle, operating at a strip temperature of 1320 F in a 8.2% CO atmosphere. 4½" lining of B&W Kaocrete-A is used on hearth and curbs.

B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick
B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick
B&W Refractory Castables, Plastics and Mortars
B&W Silicon Carbide • B&W Ramming Mixes • B&W Kaowool

BABCOCK & WILCOX
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

R-595



Use quality USS Bars

...available at your local steel service center

USS Bars are instantly available at your nearby steel service center, thanks to United States Steel's well-organized, wide-range system of product distribution.

By dealing with a steel service center, you can combine the profit-making advantages of a steel service center with the fine, quality-controlled products of United States Steel. For instance, you can order USS Bars in various types, sizes, grades and finishes —including rounds, squares, flats, hexagons, angles and channels.

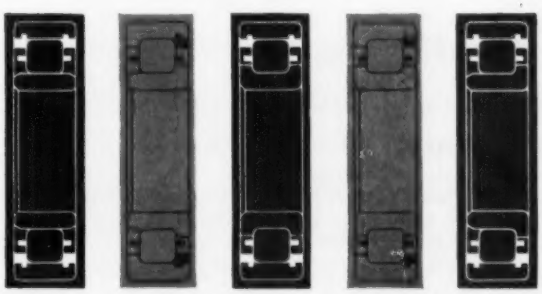
Remember, as a part of the American Steel Warehouse Association, your steel service center has been set up specifically to handle your immediate steel demands. So the next time you order bars from your steel service center, be sure to specify *USS Bars.*

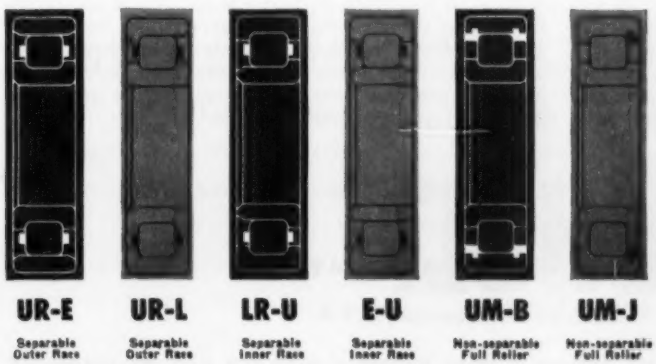
USS is a registered trademark

USS United States Steel

AMERICAN STEEL WAREHOUSE ASS'N.

The Type UR-E Tru-Rol segmented-retainer bearing illustrated above, affords adequate precision, performance and life expectancy for most "upper range" commercial-grade applications.





Rollway Tru-Rol Bearings give you "for the job" selectivity in a wide range of applications. They approach the design, precision and quality of bronze-retainer bearings as closely as commercial grade pricing will allow. Internal clearances are close. Rollers are equally spaced to avoid out-of-balance vibration and "pulse". And each is crowned to distribute the load evenly along the full length of the roller. 11 types available in single and double width bearings, in stamped steel retainer, segmented retainer or full roller construction.

ask a near-by Rollway Service Engineer to detail the quality you should be getting in your "commercial grade" bearings. No cost. No obligation. Write to

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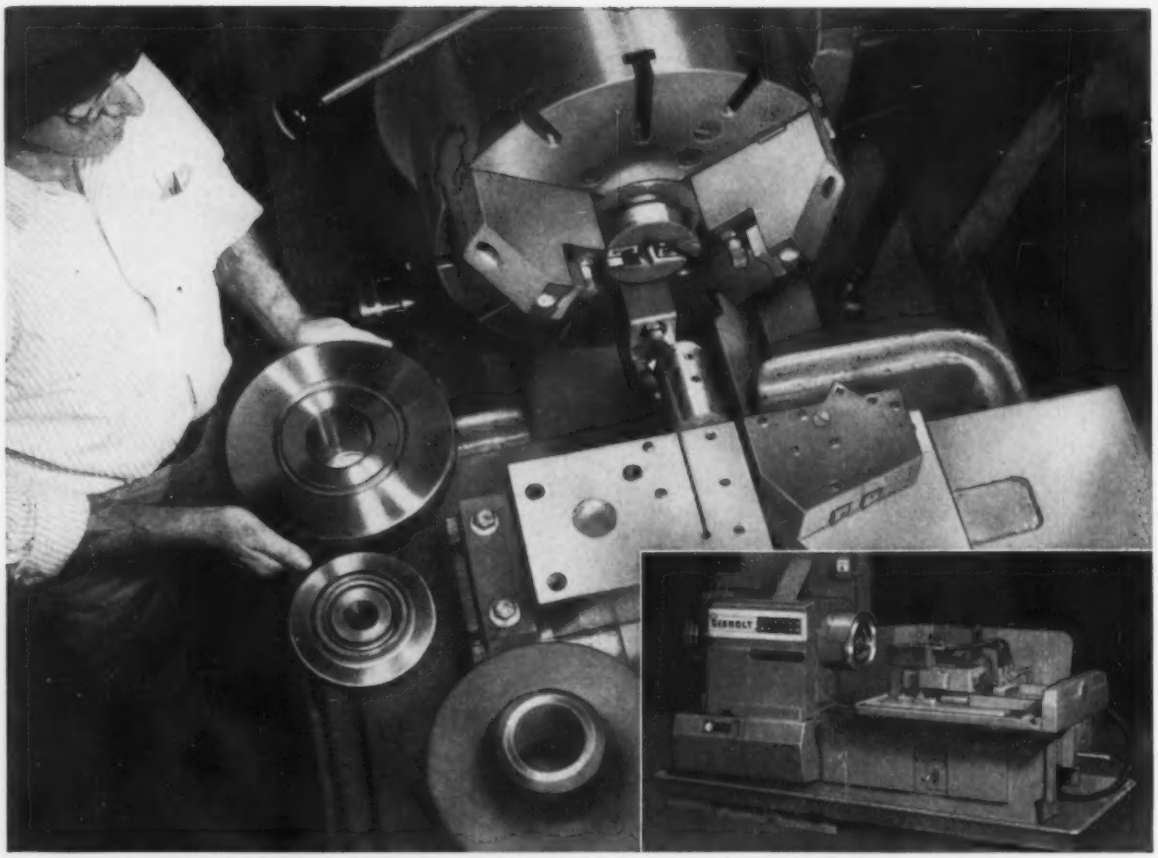
ENGINEERING OFFICES: Syracuse • Philadelphia
Boston • Chicago • Cleveland • Pittsburgh
Detroit • Seattle • Houston • Los Angeles
San Francisco • Toronto



Smart planning on Simplimatic holds f.t.f. time to 1.7 min. on 6½" diam., 3.3 min. on 10¾" diam. workpieces.

How OTM Corp. cuts costs machining parts in 13 sizes

Handles each part in single chucking, using Simplimatic with back-facing attachments and two-speed motor

You may get ideas from the way OTM Corporation, Houston, Texas, machines steel welding neck flanges and welding necks—with each part in 13 different sizes—completing each part in a single chucking and holding change-over time to an absolute minimum.

Here's how the job is done on a Gisholt Simplimatic Automatic Lathe: Facing, grooving, boring and chamfering operations are performed from tools on short tool slides, with T-slotted tops for quick adjustment. Relieving the boring tool at the end of the cut eliminates tool tracks. Simultaneously, a special back-facing attachment works through the spindle to shave-face and chamfer the O.D. on the hub. A power chuck wrench operates the scroll chuck and permits mounting this attachment in the spindle bore. A two-speed motor provides correct surface speed and permits switching from high speed (for turning and facing) to low speed (for grooving operation) and back again, during the Simplimatic's automatic machining cycle.

Here, again, the Gisholt MASTERLINE Simplimatic Automatic Lathe saves a manufacturer the cost of a special machine. Its extra wide platen table provides ample space for an infinite number of slide and tool arrangements—and its table feed permits tools to engage with the work or perform additional machining operations before actual slide movements begin. Ask your Gisholt Representative to show you how the Simplimatic performs special machine functions at standard machine prices—on your product and under your production conditions.

MASTERLINE GISHOLT SINCE 1887 GISHOLT

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin, U.S.A.

ASK YOUR GISHOLT REPRESENTATIVE ABOUT GISHOLT FACTORY REBUILT MACHINES WITH NEW MACHINE GUARANTEE

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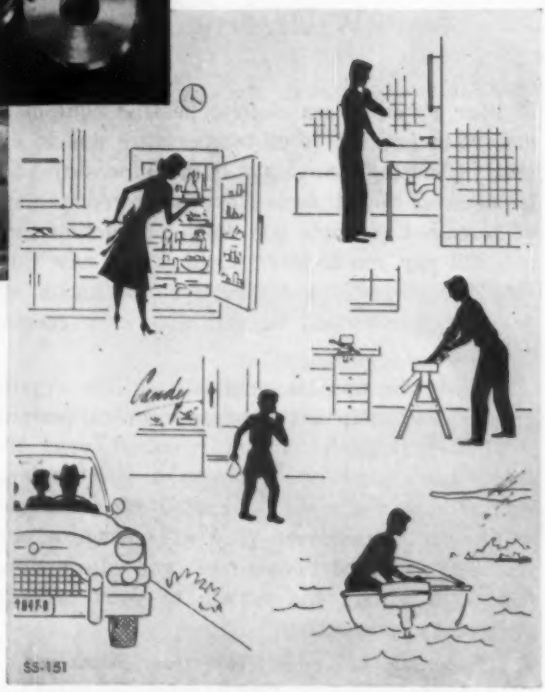
In razor blades and refrigerators, in clocks and cars, in hand saws and industrial tools, in chemicals and candy . . . almost anywhere you look, Americans use Sandvik products.

From coast to coast, Sandvik's consistent product quality and specialized service benefit both industry and the individual consumer. That's the reason why Sandvik has been growing with America since 1878.



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Branch Offices: Cleveland • Detroit • Chicago • Los Angeles

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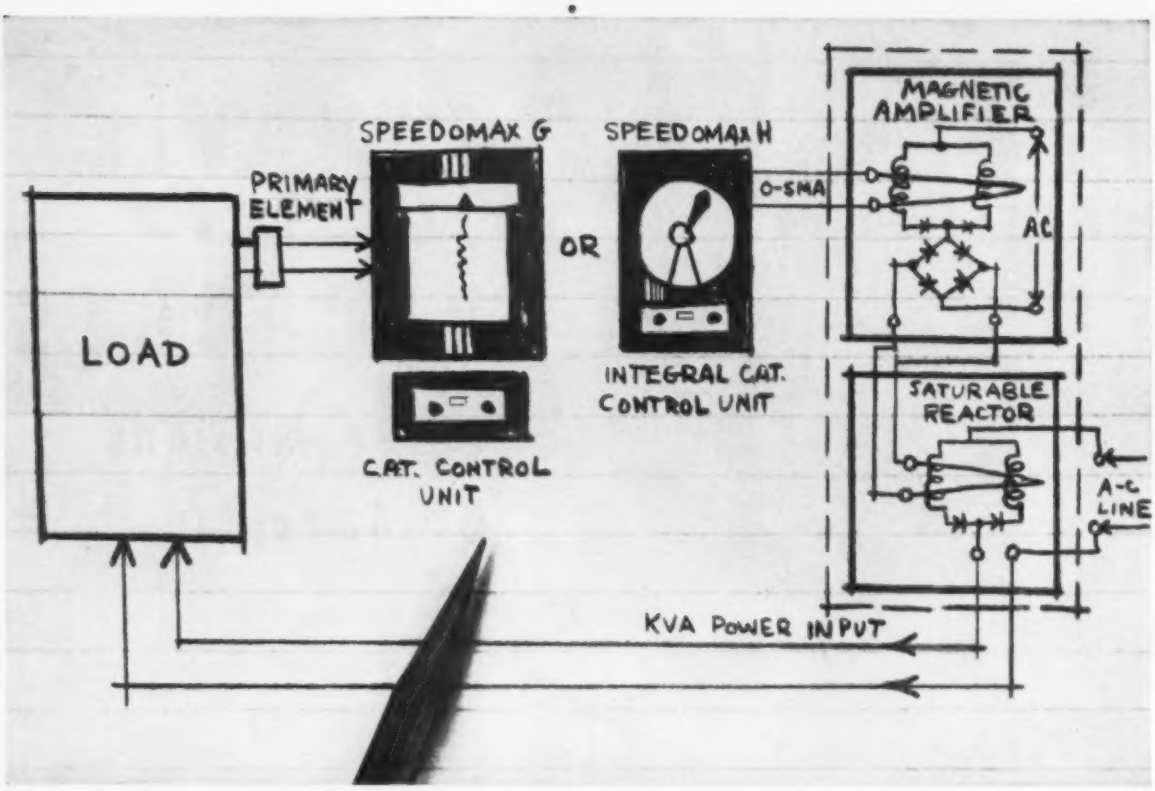

Now... Stepless control of Electric Heat Input with L&N's new C.A.T. control system

If your process uses electric heating equipment and your product is off-temperature due to cycling of heating elements at high temperatures . . . if excessive downtime and expensive replacement of worn-out contacts cut down production time . . . it'll pay you to learn about L&N's new Current-Adjusting Type control for continuous, efficient power output in saturable core reactor systems.

Already in use on applications like crystal growing and strip annealing, this control permits stepless regulation of power output over the *entire operating range of saturable core reactors.* Its rapid speed of response matches rapid changes in product temperature. The wide range of adjustment of proportional, reset and rate actions facilitates tuning the system to your process, product and production.

C.A.T. control is a complete system consisting of (1) a primary element, (2) Speedomax® recorder, (3) C.A.T. control unit, and (4) a magnetic amplifier and saturable core reactor.

Heart of the system is the C.A.T. control unit. Any temperature change, detected by the primary element and measured by the recorder, is fed to the control unit. Continuous d-c output of the unit over 0 to 5 ma range drives a magnetic amplifier. The d-c output of the magnetic amplifier is fed to the control windings of a saturable core reactor for continuous regulation of power input to the process.

If you're modernizing your present electric process equipment or installing new—make use of our wide experience in providing temperature control systems for thousands of applications. For more information, contact your nearest L&N sales office, or write us at 4956 Stenton Ave., Philadelphia 44, Penna. Ask for Data Sheet ND 46-33(107).

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aluminum stamped parts
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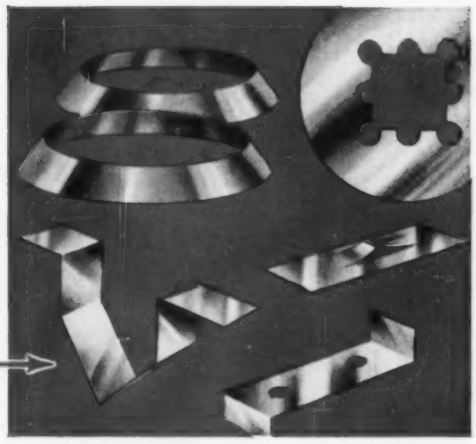

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Look under "Aluminum" in the classified phone book for your Reynolds Distributor

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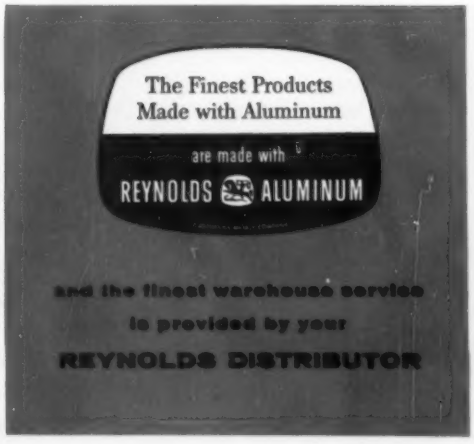
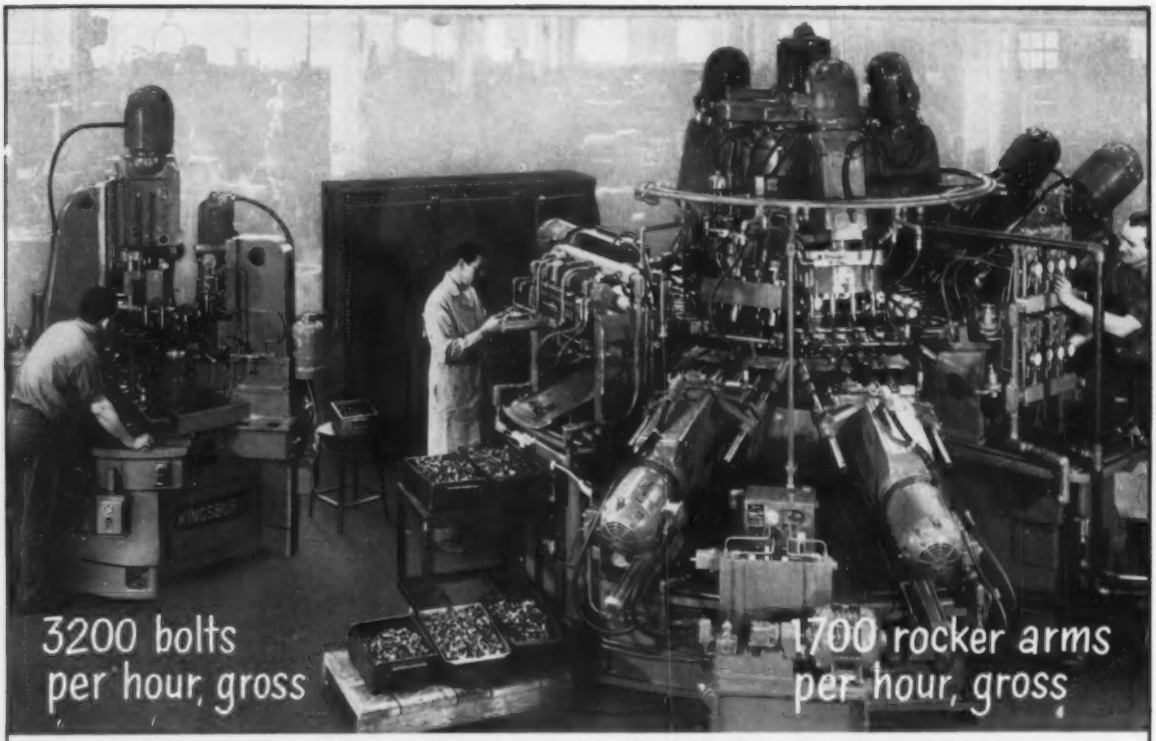
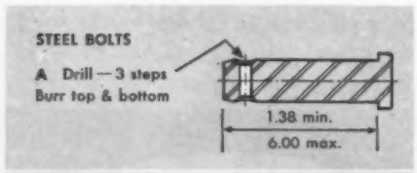


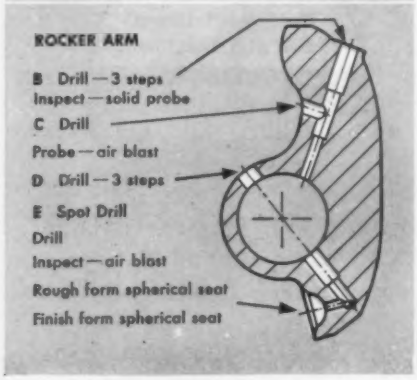


On the left — a ten-spindle Kingsbury. It completes two bolts every 2.2 seconds (including indexing). The big unit has a three-spindle auxiliary head and drills hole A in three steps at three stations. Each small unit has an underneath attachment and burrs one part top and bottom. Parts are ejected onto a chute between these burring units.

On the right — a 56-spindle Kingsbury with center column. It completes four rocker arms every 8.5 seconds (including indexing). All units have four-spindle auxiliary heads with oil mist lubrication. Units on the center column operate on hole B. Units on knees around the base work downward on holes C and D and upward on hole E. The units for hole E have hydraulic slides for more efficient changing of tools.

...talk about high production!





These two Kingsburys have extremely high production rates because they (1) operate on more than one part at a time, (2) have short time cycles by drilling in steps, and (3) automatically clamp, unclamp and eject onto chutes. The machines are on our assembly floor ready to ship. The customers have approved test samples.

One machine is fairly simple, the other complex. But both will continue to produce good parts month after month because they have good basic design and rugged, accurate construction.

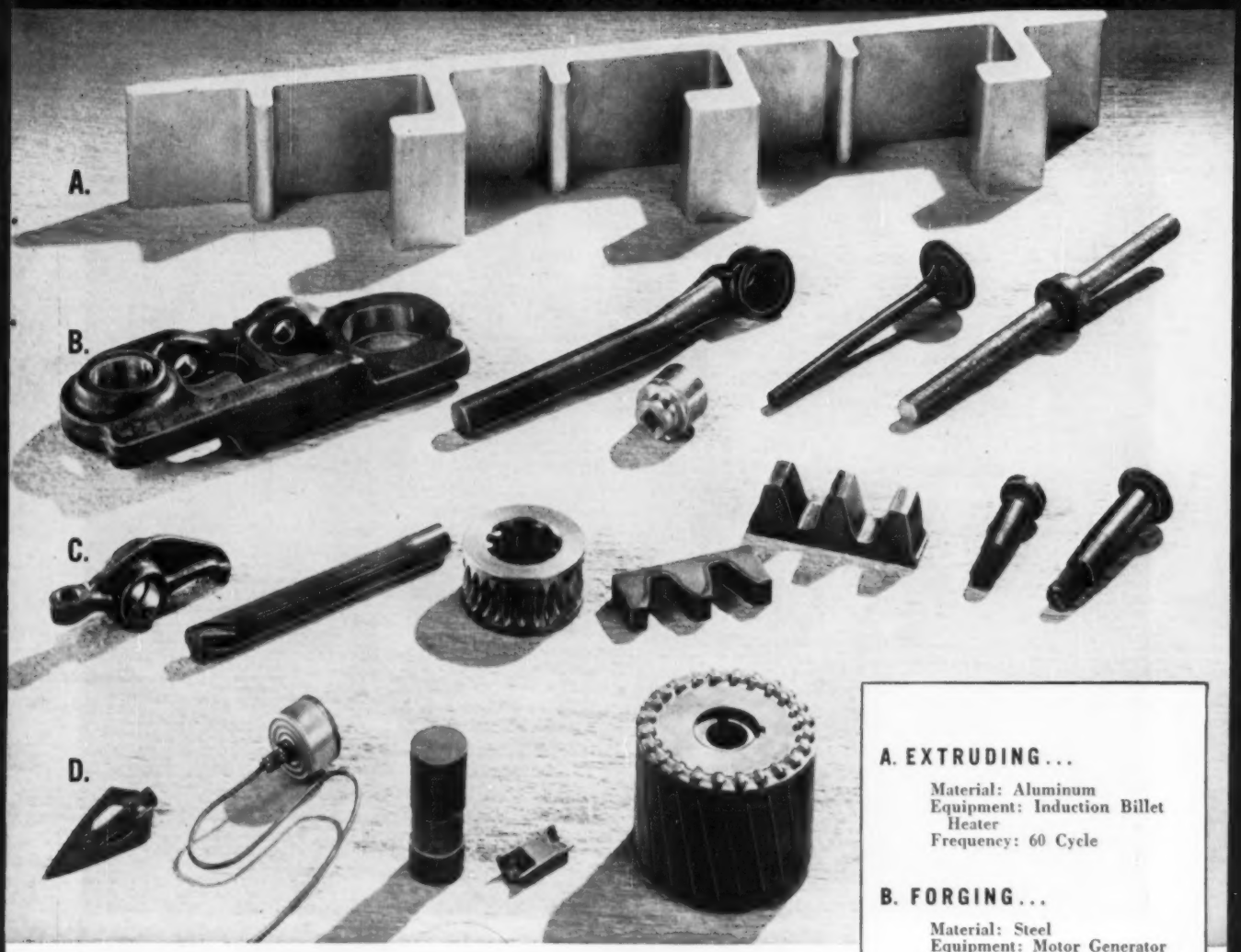
LOWER PRODUCTION RATES

Most Kingsburys produce at rates of 200 to 600 parts per hour. We design each one to meet the customer's requirements. On most machines each fixture holds only one part. Many have manual clamping.

For 38 years we have built machines that our customers don't worry about. May we do the same for you? Kingsbury Machine Tool Corporation, Keene, New Hampshire.

KINGSBURY

METAL TREATING WITH MAGNETHERMIC INDUCTION HEATING



A. EXTRUDING...

Material: Aluminum
Equipment: Induction Billet Heater
Frequency: 60 Cycle

B. FORGING...

Material: Steel
Equipment: Motor Generator
Frequency: 3,000 and 10,000 Cycles per Second

C. HARDENING...

Selective and Surface

Material: Steel
Equipment: Motor Generator, Electronic Induction Heater
Frequency: 10,000 Cycles per Second; 450,000 Cycles per Second

D. BRAZING...

Material: Copper, Brass, Steel
Equipment: Motor Generator, Electronic Induction Heater
Frequency: 10,000 Cycles per Second; 450,000 Cycles per Second

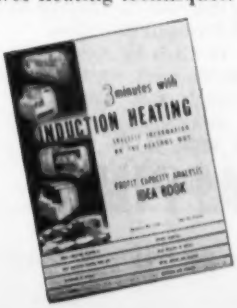
ten years ago . . .

INDUCTION HEATING never entered this picture

Parts like these were heated by costly, conventional methods. The amazing potentials of induction heating had not yet been realized.

Today, MAGNETHERMIC induction heat processes such parts in seconds, with complete production-line automation. Cost-conscious production men everywhere call on MAGNETHERMIC for important cost reductions in all types of metal treating . . . surface hardening, tempering, annealing, stress relieving, and billet heating, to name a few.

Tomorrow, new products, many unheard of today, will require still newer heating techniques. MAGNETHERMIC engineers, creative leaders in the field, are ready with the newest concepts in induction heating to help you reach new production horizons.



This "A-B-C's of Induction Heating" booklet will be most helpful. Write today for your free copy. Send a part or detail prints for authoritative analysis.

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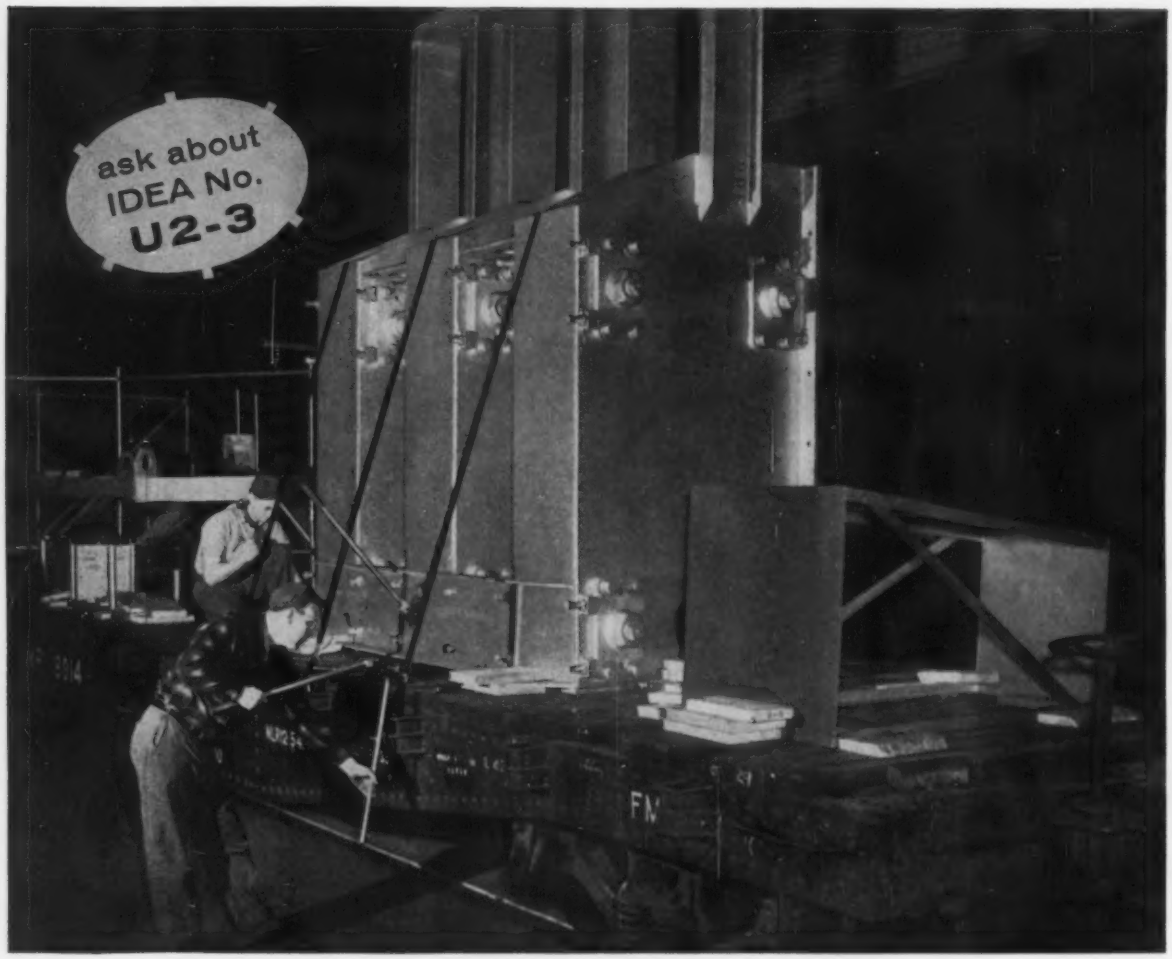
CORPORATION
3990 SIMON RD. • YOUNGSTOWN 7, OHIO

Engineering Idea Leadership in Induction Heating
60 to 450,000 Cycles



Consult your AIM*. . . Whiting Corporation does . . .

Acme Steel Strapping protects electric furnace shipment

When the world's largest electric copper melting furnace left the shops of its manufacturer, Whiting Corporation, Harvey, Illinois, it was securely braced and protected for flatcar shipment with heavy-duty Acme Steel Strapping. It arrived without damage, shifting, or delays en route for securement adjusting. (Idea No. U2-3)

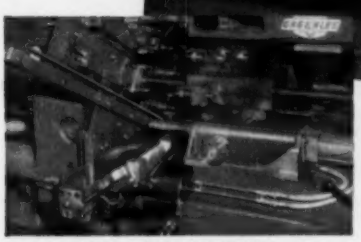
Acme Idea Man Andy Bassi helps Whiting Corporation solve its carloading problems.

Whiting Corporation relies on heavy-duty Acme Steel Strapping to tie-down and protect rail shipments of all heavy industrial machinery and equipment it manufactures. Shipments are loaded and secured with steel strapping in less than half the time required by the former method of using threaded steel rods that had to be shaped to fit the loads. And a crew of only two men, instead of three, can do the job, releasing a man for other plant duties.

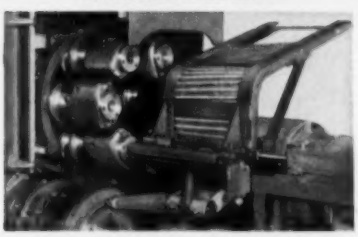
***Consult your Acme Idea Man** for advice on ways to better protect your products for handling, shipping, storage. His Ideas-in-Action files contain scores of performance-proved Ideas that can be adapted to meet your needs. Write Dept. IFU-88, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**

Second Operation



MAGAZINE LOADING



REAR LOADING MAGAZINE

HAND LOADING

A Method of Machining That Pays Off

Greenlee standard Automatic Bar Machines, adapted for second operation work, profitably machine a wide variety of parts. Long shafts or short pieces are automatically loaded into the work spindle by any of the various loading arrangements shown. Parts are loaded in one position during the machining cycle, and machined in the remaining five cross slide and end working positions. For more information, see your Greenlee Distributor.

WRITE FOR CATALOG No. A-405

GREENLEE STANDARD AND SPECIAL MACHINE TOOLS

- Multiple-Spindle Drilling and Tapping Machines
- Transfer-Type Processing Machines
- Six and Four-Spindle Automatic Bar Machines
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Wide variety of alloy and stainless steel products made possible with Standard's new electric melting furnace

With installation of our new electric furnace, we at Standard are now equipped to give you even better service—even faster deliveries—and much greater variety of steel analyses—than ever before.

These expanded facilities provide you with an in-plant source of forgings, castings, rings and flanges from virtually any specialty alloy steel, including bearing grade steels, tool steels, high temperature steels, and stainless steel.

Discuss your next requirements with us. You will appreciate our service as well as our quality. Write Dept. 1-H.

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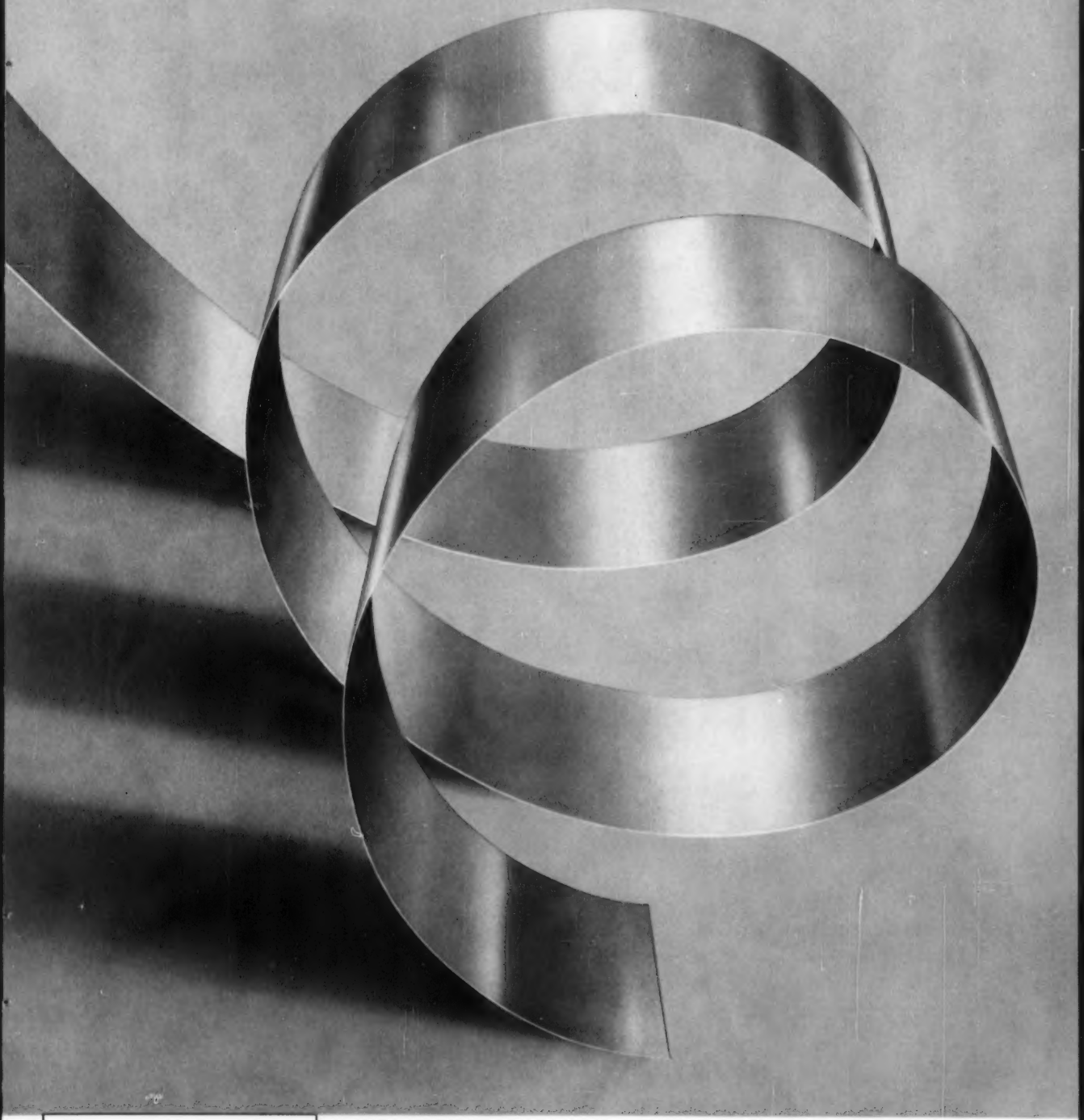
stainless strip – to your specifications

If stainless strip is part of your product, consider using Crucible stainless. Crucible precision-rolls it to your exact specifications — produces finishes that are surpassingly lustrous. And Crucible's painstaking methods ensure uniform metallurgical quality as well as gauge uniformity in coil after coil. Why not obtain these combined qualities next time you need stainless? Crucible stainless is available in all gauges down to .010" and in all widths. Write to *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



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Canadian Distributor — Railway & Power Engineering Corp., Ltd.

DON'T BE PENNY-WISE AND POUND-FOOLISH! Some silicon products are cheaper than others, but the one that *seems* cheapest may not be the best for your particular application . . . and can often cost you more in the long run. Silicon has so *many* uses as an alloying element that it is not always easy to select the silicon product that will give you best results . . . at the lowest *final* cost.

Because VCA produces a complete line of silicon products, no one is more qualified than your VCA representative to give you an *impartial* recommendation of those best suited to your applications. Just call your nearest VCA District Office.

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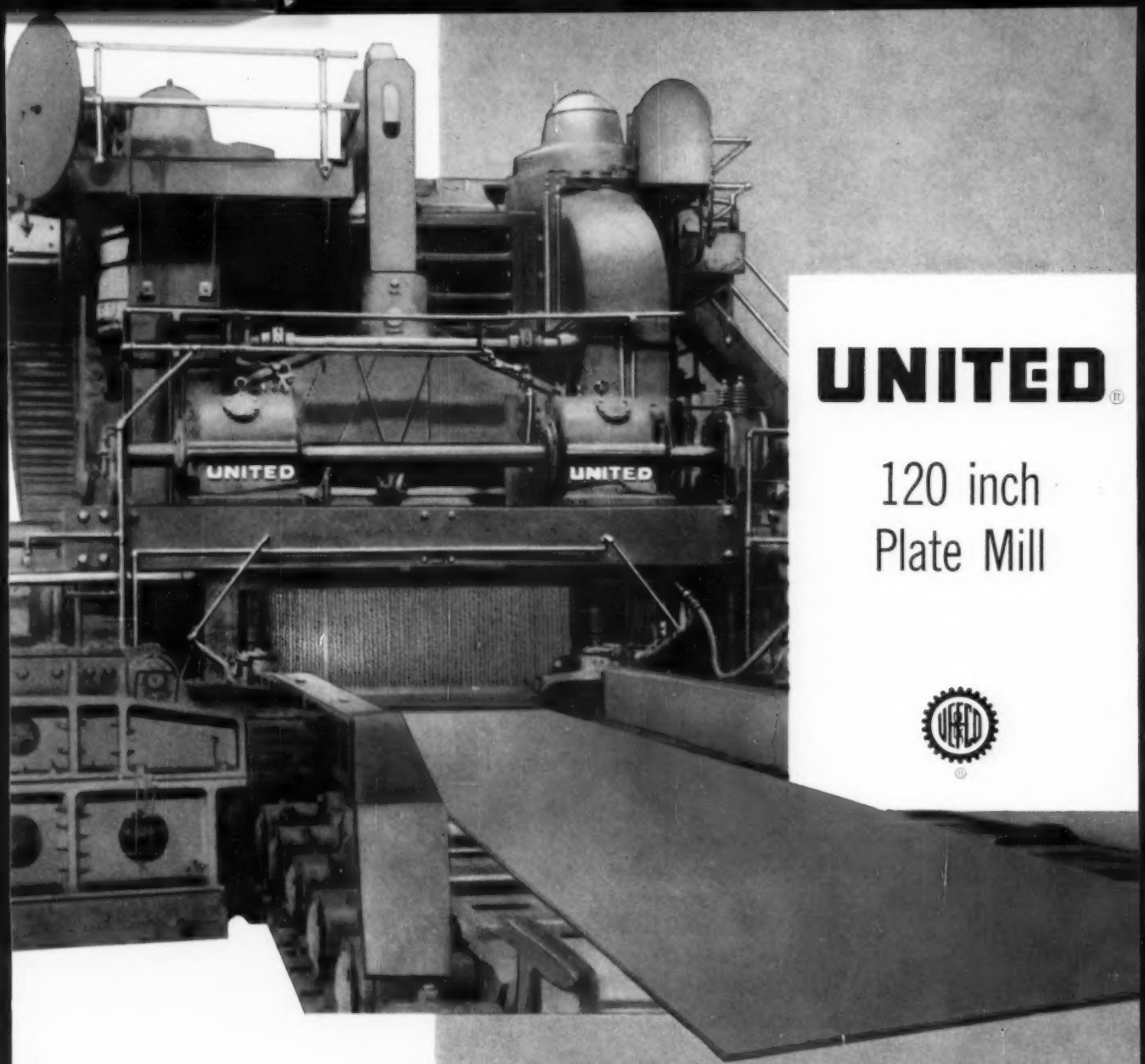

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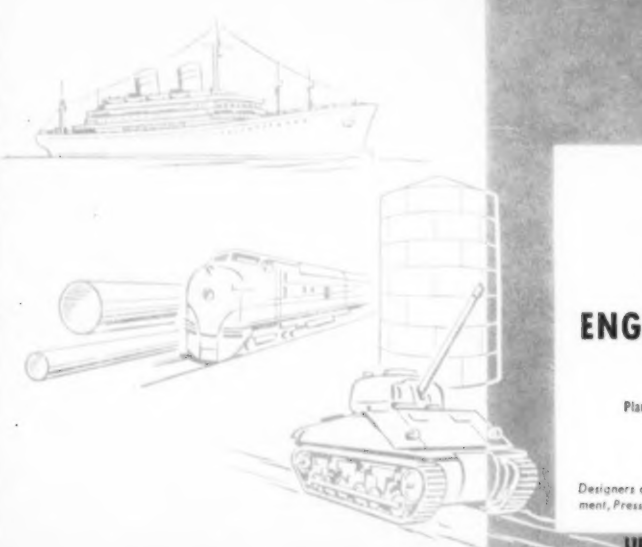

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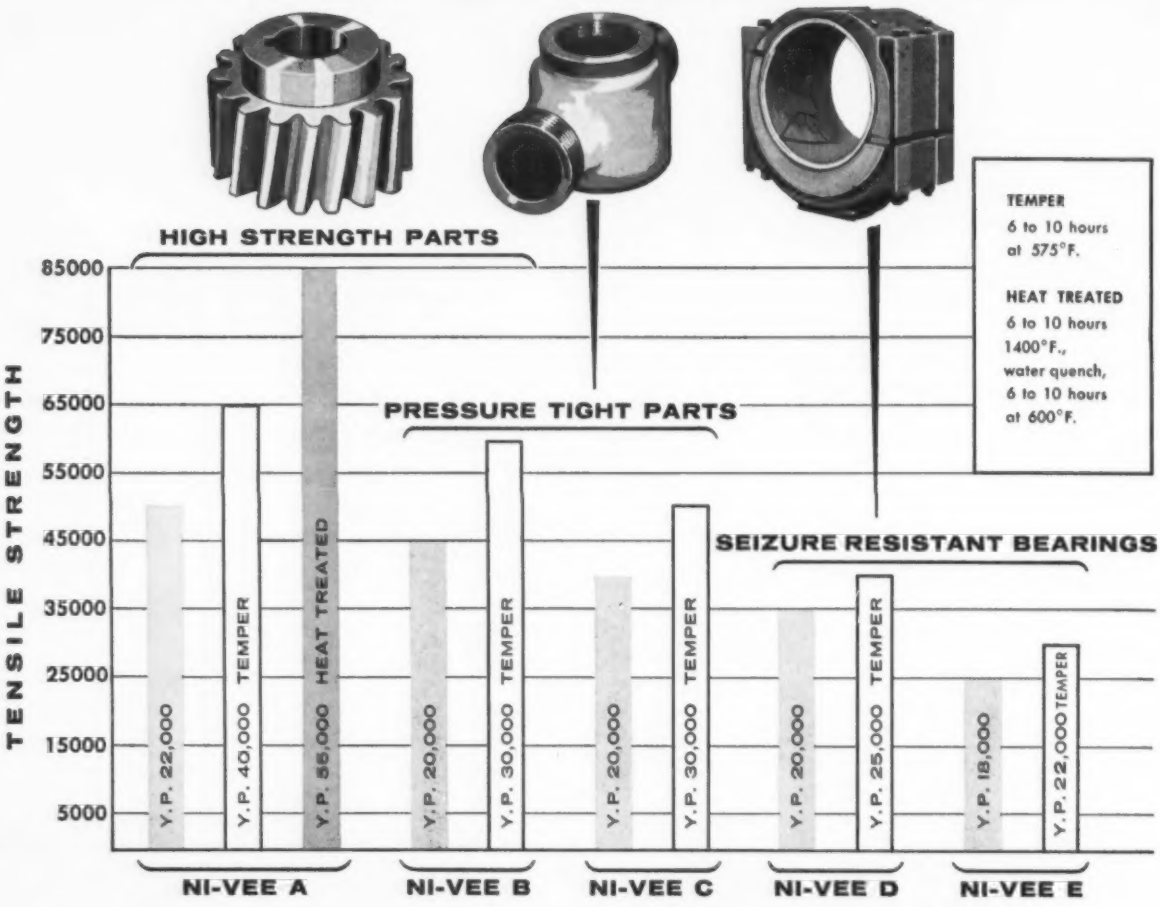
UNITED *can serve you no matter where in the world you are.*

TYPICAL NI-VEE BRONZE PROPERTIES



5 high-performance bronzes

These versatile Ni-Vee alloys provide a range of properties that satisfies the requirements of most copper-base castings

The chart shows the range of tensile properties of the five Ni-Vee* bronzes and indicates the types of castings made with these alloys.

As you can see, you can satisfy the majority of your specifications for quality copper-base castings from among these five versatile Ni-Vee materials. Their "As Cast" mechanical properties – especially yield strength – surpass those of comparable G and leaded bronzes and red brasses.

The chart also shows what simple heat treatment does to step up their properties. Bear in mind that values taken from the chart are typical. In practice, higher values can be obtained.

Ni-Vee extras

You can expect superior performance from all five Ni-Vee bronzes. For example. Ni-Vee B, C, D, and E (the leaded group) can be used for castings of all three classifications shown. Ni-Vee A provides extreme strength. Ni-Vee E gives you extreme resistance against galling or seizure. The low zinc group (Ni-Vee A, B, D and E) show little tendency to dezincify, insure top-notch resistance to stress corrosion. All five, of course, have the excellent general corrosion resistance of copper reinforced by a 5% nickel 5% tin content.

Helpful booklet gives complete information on Ni-Vee bronzes

"Engineering Properties and Applications of Ni-Vee Bronzes" covers tables of composition, charts on deformation, friction, fatigue, elevated temperature service, electrical resistivity, wear and other engineering data. Write for your copy today.

*Registered trademark

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67 Wall Street (INCO) New York 5, N. Y.

NI-VEE BRONZES
NICKEL ALLOYS PERFORM BETTER LONGER

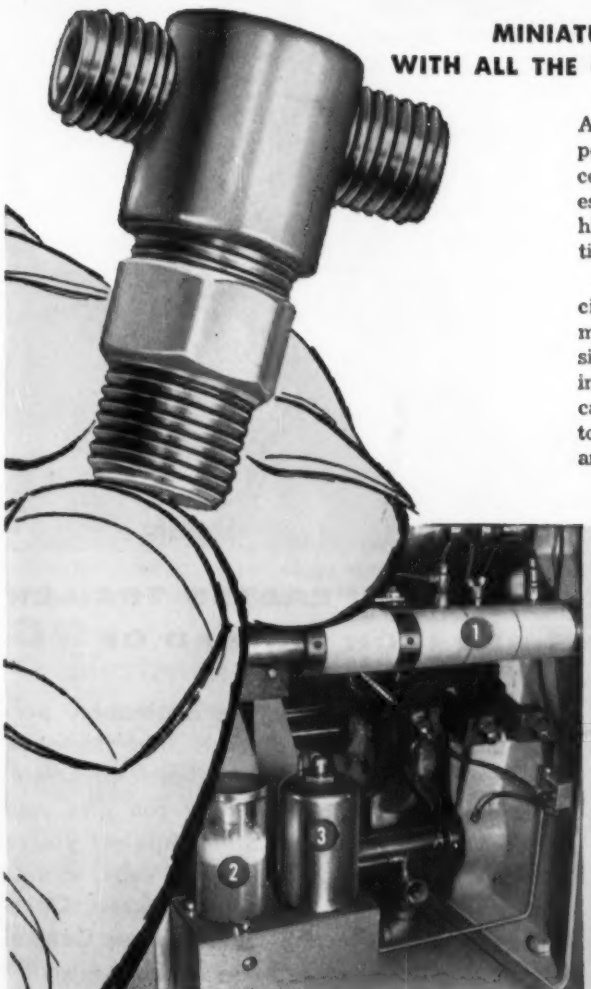
NOW! Any Machine Can Have The Advantages of Centralized Lubrication... At Low Cost!

Alemite "MINIATURE" ACCUMITE System

MINIATURE SIZE FOR LIMITED SPACE—
WITH ALL THE QUALITY OF HIGHER-PRICED SYSTEMS!

Alemite—with 40 years of centralized lubrication experience—announces an all-new miniature system complete with pump, metering valves and controls—especially designed to service many machines and vehicles where centralized lubrication has been impractical until now!

Alemite's new midget-size Accumite system is especially adaptable to light, precision, multiple-bearing machines that have limited installation space. Its small size and simple installation overcomes cost limitations in most plants. Typical applications are: packaging, canning, labeling and textile machines . . . and machine tools. It is also suitable for tractor trailers, lift trucks and farm implements.



Accumite lubricates 24 points of spring winding machine.
1. Valves mounted directly on bearings. 2. Transparent lubricant reservoir. 3. Manually controlled air pump, actuated by "push-pull" valve.

ACCURATELY METERS THESE SHOTS OF OIL OR GREASE

.003 cu. in. .006 cu. in. .009 cu. in.

ALL THE ADVANTAGES OF "BUILT-IN" MEASURED LUBRICATION—PLUS MIDGET SIZE!

- Meters exact amounts of refinery-clean lubricants to all bearings whenever system is operated.
- Eliminates shutdown time for lubrication.
- Seals lubricant against dirt, grit and water.
- Prevents bearing troubles due to neglect or use of wrong lubricants.
- Services all bearings in one operation.
- Avoids work spoilage and bearing repairs due to overlubrication.

Mail coupon for full information!

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Please send me all the facts about your new "Miniature" Accumite system.

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Symbol of **SW** Excellence

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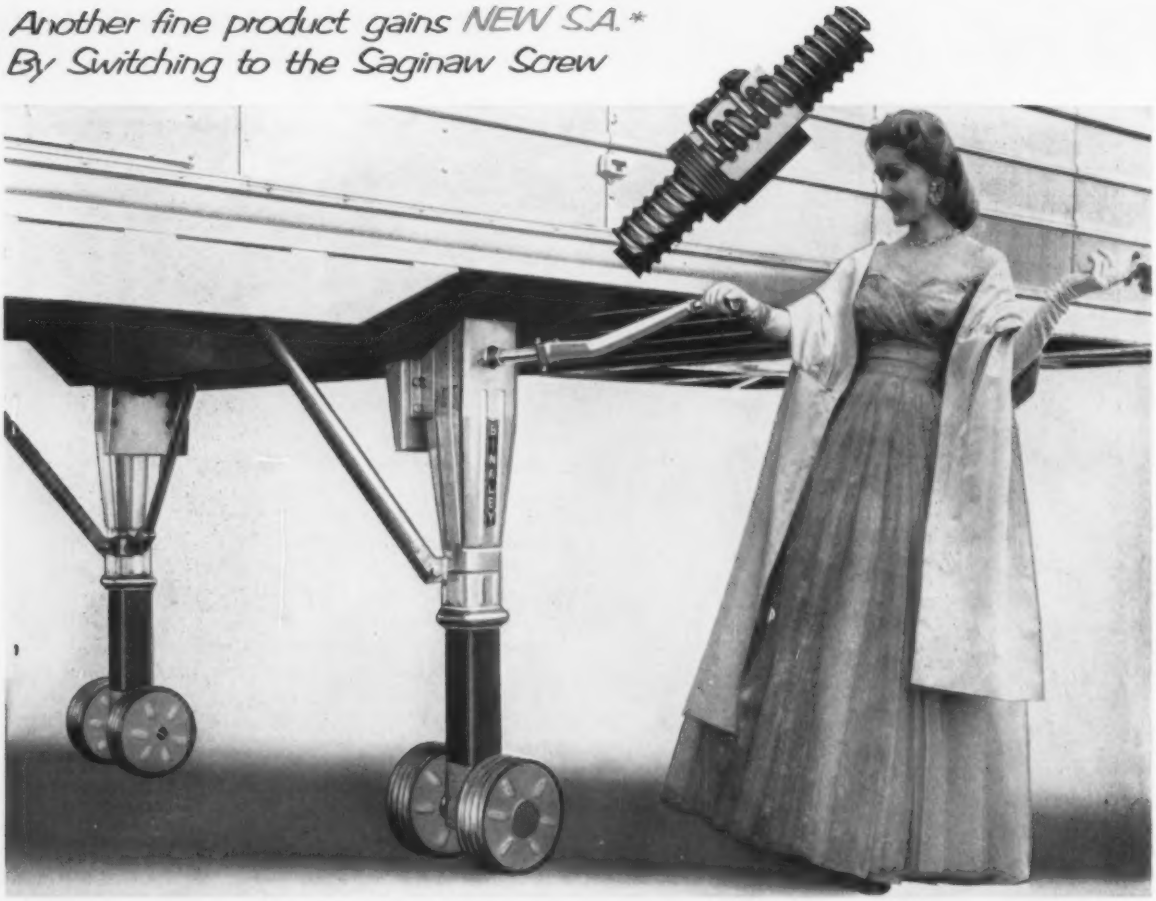
Another fine product gains NEW S.A. By Switching to the Saginaw Screw*



WORLD'S MOST EFFICIENT ACTUATOR OPERATES TRAILER LANDING GEAR WITH 5 TURNS PER INCH INSTEAD OF 20

It's "happy landings" for truckers from now on—since Binkley Manufacturing Company has developed and marketed a new truck trailer landing gear which can be raised with 75% less cranking. They gave their product this new ***S**ales **A**ppeal by switching from a high-friction acme screw to the almost frictionless Saginaw Screw.

The truly amazing ability of the Saginaw Screw to convert rotary motion to linear motion with over 90% efficiency is saving power, space, weight and assuring smoother, more dependable performance in countless products from miniature electronic controls to giant production equipment.

Perhaps the Saginaw Screw can give your products that vital new **S**ales **A**ppeal you're looking for right now. To find out, write, wire or telephone Saginaw ball/bearing Screw Operation, Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Michigan—*world's largest producers of b/b screws and splines.*

**Give your products NEW SALES APPEAL... switch to the*

Saginaw ball bearing Screw

Trade Talks Coming

Despite earlier rebuff by a Canadian group, plans for a conference to smooth U. S.-Canadian trade relations are still very much alive. At least two important trade groups, U. S. and Canadian, are drafting plans for the first such get-together, probably to meet in the Midwest this fall.

Missile-Buying Plans

The Pentagon plans to buy liquid-fueled missiles (Thor, Atlas, Jupiter, Titan) for several more years. Despite new efficiency in solid-fuel propellants, liquid-fired missiles can carry heavier pay loads, will probably never be replaced all the way.

Predict Productivity

At least two reports are being prepared for fall presentation that will prove employee productivity levels can be predetermined by pre-employment testing. One will try to show actual dollar gains scored by linking worker productivity to correct use of such tests.

Electrochemical Machining

A metal removal rate of 60 cu in. per hour on an area of 200 sq in. is reported for a new electrolytic machining process. Accuracy is on the order of 0.003 in.

Deep Draws Tool Steel

Cups 52 in. long and 28 in. in diam are being deep drawn from a tough, heat-treatable 5 pct Cr tool steel. Successful drawing depends on high quality sheet material plus a carefully controlled series of subcritical anneals between draw stages.

Detroit Slows Automation

There are signs that auto makers are shying away from extremes in automation. New facilities for '59 production have fewer unbroken transfer lines. Individual machine tool units are much in evidence, so is hand loading and unloading of these units. The pressure is on to get more machine flexibility. Automatic equipment will be forced harder than ever to pay its own way.

Plastic Tooling Plates

Epoxy plastics are now being used to make precision tooling plates up to 20 ft long. Plastic is simply poured against the face of a flat master and at the same time reinforced with a core of welded sheet metal. It picks up exact details, can in turn be used as a master.

New Titanium Upsurge?

While it may not have cut as wide a swath as originally expected, titanium is generating new interest in ordnance circles. The military sees it as the brightest prospect for cutting weight off structural elements on armored vehicles. Ways are being found around some of the old drawbacks.

More Basic Sprung Roofs

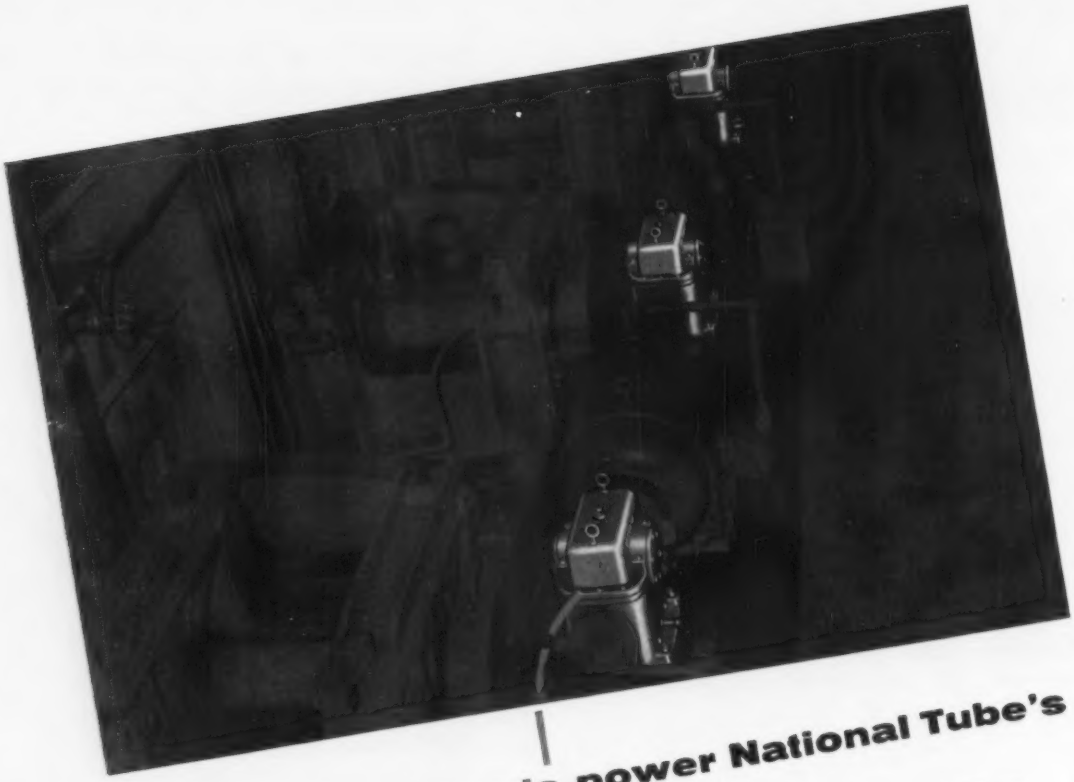
Basic roofs of the sprung arch type are going on openhearths at two more steel mills. Designed to meet the temperature and strength demands of oxygen roof jets, sprung basic construction has given good results on four openhearths at one mill. Now it will be tried on more furnaces.

Plots U.S. Rust Pattern

The different rates at which rust eats through uncoated steel have now been established for 523 U. S. cities of 10,000 or more population. Based on test-panel exposure results collected over the past 25 years, the study gives an accurate picture of relative corrosion rate in virtually every corner of the country.

Air Patent Reforms

Proposals to reform the patent system to provide some means of compulsory licensing are being revived in Congress. Plans range from all-out compulsory licensing after a short period of exclusive use, to forced development and forced cross-licensing to aid another invention.



8 coordinated Clevelands power National Tube's unusual tempering furnace

A total of 8 coordinated Cleveland Worm Gear speed reducers work in harmony to transmit power on National Tube's tempering furnace at McKeesport, Pa. Vital to their Warm Working Process, it heats pipe 900-1000° prior to entering the sizing mill.

Operating from a single power source these Cleveland right-angle drives handle the huge job of power transmission required to keep pipe production at high output rates.

That's a big reason why compact, rugged Cleveland Worm Gear drives are found in plants across the country where heavy-duty drives of proven dependability are required.

Cleveland's new Bulletin 145 gives the latest specifications on the entire line of speed reducers. Write for your copy today. The Cleveland Worm & Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.

CLEVELAND
Worm Gear
Speed Reducers

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

Business Men Are Learning — It Pays to Talk Politics

Many have decided that in politics, as in business, you get the best results when doing your own selling.

Look for more grass roots campaigning by business in the days ahead.—By R. O. Schulin.

■ After years of shying away from politics, business is waking up to the fact that labor has amassed a tremendous amount of political power. Now, more companies are coming up with political action programs of their own as they realize that:

1) Business can't expect its associations to do all its politicking.

2) Having a favorable administration in Washington isn't enough.

3) Politics and business aren't necessarily incompatible.

4) Business must get out and do its own grass roots campaigning.

Why the Sudden Alarm? — For years organizations such as the National Assn. of Manufacturers and the National Small Business Men's Assn. have been sounding the warning to business men, namely: If you don't get active and protect your political rights you might lose them.

Trade and business associations can be effective in lobbying for or against national issues, they explain, but it's impossible for them to campaign in every precinct and congressional district in the country. And without the right men in Congress, all the lobbying in the world won't do any good.

Rep. Gwinn Speaks—Complains Rep. Ralph W. Gwinn (R-NY): "The trouble in Congress is not that we don't know what legislation is needed. We don't have the votes to get it passed.

"Organized labor is subject to the same restrictions against political activity as business, yet look what they have done in building a most effective political machine in

Why Business Should Get Into Politics

By Adm. Ben Moreell, retiring chairman, Jones & Laughlin Steel Corp.

"If business men were to consider the intrusion of government into their official affairs as solely an economic problem, there would be ample justification for regarding that intrusion as a matter warranting major management attention.

"This is readily apparent from the fact that in a normal operating year such, for example, as 1957, taxes paid out in cash to Federal, state, and local governments by a producer in basic industry — such as Jones & Laughlin—amounted to more than three times the cash dividends paid out to the owners of the business.

"It is imperative, therefore, that management awaken to the importance of this 'unseen partner' and inquire into the efficiency with which he is handling corporate funds turned over to him, presumably in return for services rendered.

"But there is an even greater imperative for business management, which is the preservation of the values of the stockholders' property. When 'government ownership of industry' ideas are on the rampage, as they are now, and when the only antidote to these are 'private ownership ideas,' it is the duty of management to take such steps as are necessary to promote private ownership ideas which serve to conserve private property values."

GE'S PARKER: "We are willing to invest some temporary unpopularity in order to be sure that what we regard as the truths basic to the political issues involved have received fair consideration."

less than 10 years," Rep. Gwinn points out.

A Reawakening — While labor jumped into national and local politics with both feet, business by and large stood by disinterested or disorganized while social security, unemployment compensation, minimum wages and hours, union elections, and many other items costly to business were written into law.

HENRY FORD II: "It is our duty to know the issues involved. It is our obligation to take an active interest in the candidates and to make a critical appraisal of the policies."

Now business leaders are hoping that a political renaissance has hit the U. S. business community. Says Sen. Barry Goldwater (R-Ariz): "A business man should be able to see by now that if he is to survive under the free enterprise system he has to make his voice heard."

Getting Started — The growing list of companies who have come out into the open with political action programs include: General Electric, Ford, U. S. Steel, and Jones & Laughlin Steel Corp.

Their programs involve such steps as practical politics seminars for management men and circulation of policy statements on political issues to employees.

New Groups Formed—Adding to the momentum are programs initiated by local business groups such as the Syracuse Chamber of Commerce political seminar for management men.

One of the aims of the newly-organized Americans for Constitutional Action is to "assist in research and education as to the forces now active in American political life; to consider and utilize the most practical political action by which these problems may be solved . . ." ACA's board of trustees is made up of such noted industry leaders as Jones & Laughlin Steel Corp.'s Adm. Ben Moreell, Armstrong Cork's H. W. Prentis, Jr., and McGraw-Edison's Charles Edison.

Special Posts Created — More evidence of growing concern by business over its political failings is the creation by at least two large organizations of special departments to deal with the problem.

General Electric recently established a Government Relations Service, under management of Vice President J. S. Parker. Its purpose, says GE, is to identify general governmental trends, develop background information on public issues and legislation that affect business, and try to develop more realistic and mature political understanding within the company.

The National Assn. of Manufacturers, which since 1895 has sought to encourage political action by business men, only 18 months ago centered this phase of its operations under a new Director of Public Affairs post.

Small Business Role—But while big business is taking important strides in the direction of political reform, the largest share of the burden must necessarily rest on small business men, who are closest to the local issues.

The National Small Business Men's Assn. reports that "small business has more political traction now than at any time in history."

While in the past NSBMA has concentrated on national issues, it is now urging its 13,000 members to participate actively in politics at the local level. It's planning a

NAM'S SLIGH: "We must work like Trojans in politics. We must overcome the latter-day prejudice against political activity and the idea that politics is the business of the politician."

barrage of literature to help guide members through the ups and downs of precinct politics.

The Failings, To Date—"Small business men are usually willing to take part in politics but often they go about it in the wrong way," an NSBMA spokesman explains. "Too often they get into political arguments and lose their tempers—and that can lose votes."

What Is the Corrupt Practices Act?

The Federal Corrupt Practices Act forbids any corporation or labor organization to make a contribution or expenditure in connection with any election where Federal candidates are to be elected.

It applies to primary elections, political conventions, and caucuses held to select candidates for office.

The "crime" of political expenditures has been defined as involving (1) the expenditure of general funds with (2) intent to reach the general public and (3) intent to influence the general public on how to vote.

However, no corporation has ever been charged with violating the Act. The four cases on record to date involved labor unions. There were no convictions. Now there are serious doubts as to the Act's constitutionality.

The Loopholes

Having already lost four times, the Justice Dept. is wary of attempting further prosecutions under the Act. It leaves several courses of action open to corporations. According to the latest interpretation:

If a corporation expenditure is approved by a political convention it may fairly be termed voluntary, and is therefore legal.

Corporations may use any means of communications desired to advise employees, stockholders, or customers on political issues or candidates.

An organization may present the record of any candidate to its members, stockholders, or customers by means of newspapers, magazines, paid advertising, radio, and TV programs.

A company spokesman may compare company views with candidates on radio and TV shows, and through publications.

Should such comparisons or discussions also reach the general public, it is not a violation of the Act unless it can be proved that the organization intended to influence the voting public.

Then there is a hazy notion held by many uninformed business men that it is illegal for them to indulge in political action. It's true the Corrupt Practices Act makes it a criminal offense for a corporation to contribute funds to any Federal election, primary or political convention or caucus held to select candidates. Still there are several ways a company can stimulate political interest among its employees and remain within the bounds of the law, says NSBMA. A company can:

Give workers and employees time off to vote.

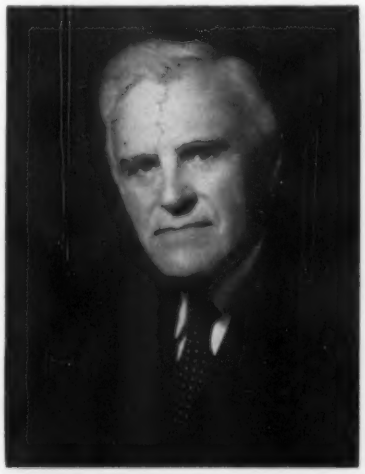
Arrange for candidates to tour the plant and visit with employees.

Pay full salaries to employees who spend part of their time in political activity.

Management may discuss political matters with employees.

A Selling Point—Politicians are becoming more conscious of small business and its political power, says NMTBA. It's to the politician's advantage to see that industry in his bailiwick is flourishing. A prospering company provides steady jobs for voters, and a working voter is likely to be a happy one.

Splitting the voting population along class lines is not the goal of the nation's business leaders. Comments Sen. Goldwater: "I don't suggest we wind up in a fight between business and professional people on one side and working people on another—because we are all working people. But we cannot let the government become lopsided by the failure of any of the people to exercise their constitutional privilege in politics."



REP. GWINN: "Business organizations must stop looking for excuses to stay out of politics. The trouble in Congress is . . . we don't have the votes to get favorable business legislation passed."

Unity Urged—The Senator's plea for national unity is supported by Mr. Parker of General Electric who in his company campaign is urging that employees work for and contribute to the party of their choice.

"The best way in the long run to assure good government is to have men of sound and independent judgment in both parties," says Mr. Parker.

First Test Coming—How big a change this new political consciousness will make in who runs the government remains to be seen. As yet it is too new to have shown any tangible results.

But it is obvious that the business man is beginning to make his voice heard in the public forum. The first real test will come in November.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

It Pays to Help the Customer

Wheelabrator Has Found It's Way to Build Sales

Steel abrasives maker invests time and effort to streamline customers' blast cleaning, and cut operating costs.

Result — Sales are booming, expected to rise another 40 pct in the coming year.

▪ Helping the customer help himself is making friends and boosting abrasives sales for Wheelabrator Corp., Mishawaka, Ind.

Wheelabrator is selling more steel abrasives by advising its customers on how to cut cleaning costs. Its engineering-sales teams have logged as much as 200 man-hours in analyzing a customer's cleaning set-up and preparing a report. It's seldom that less than 20 man-hours are spent on a project.

How It Works — G. O. Pfaff, abrasives sales manager, comments: "If a salesman came to your door and said he could cut your weekly food bill 30 pct without any change in the quality of the food you are eating, changing only the method of preparation, you would probably be skeptical but interested.

"If he produced his 30 pct savings and then offered another 20 pct savings by use of his product, you'd be eager to give him a further chance."

Why It Works — Wheelabrator's approach to sales, while not basically a new idea, is probably carried farther than most companies care to go. In addition to logging long hours to suggest improvements, Wheelabrator trains maintenance and operating personnel at the customer's plant, and even at some advance courses at Mishawaka.

They help set up standard operating practices and cost controls, and follow up later to see that an operation stays at top efficiency.

The payoff has been worth it. Since the program was initiated about a year ago sales have increased to where they represent about 30 pct of the total market. The company has doubled its abrasives sales force in the last year. Sales manager Pfaff expects to increase sales 40 pct during the next year.

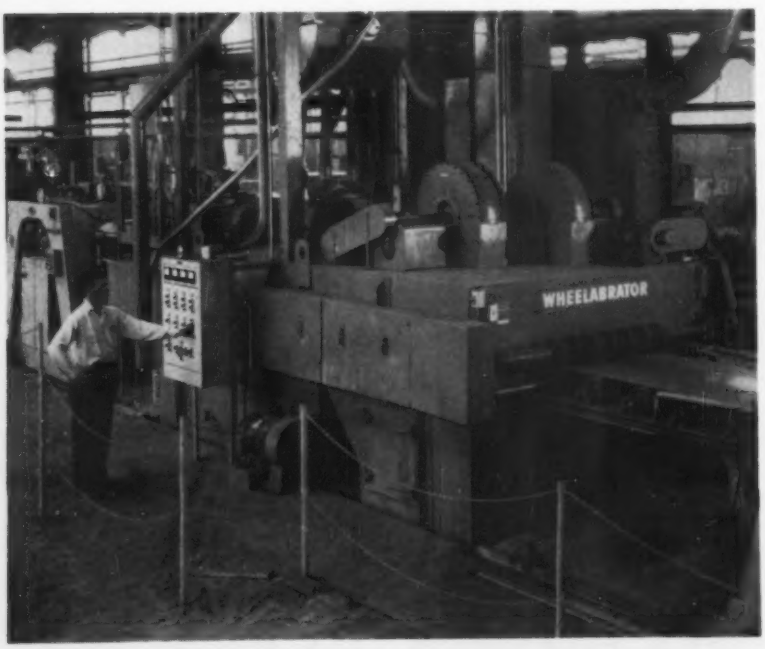
Recession Helps—The recession has been mostly silver lining for Wheelabrator. Abrasives sales manager Pfaff explains, "Prospects are vitally interested in our story today because costs are up and sales and profits are down. But a year and a half ago, when times were good, we had trouble getting them to listen."

Once in the door, Wheelabrator salesmen-engineers usually experience little difficulty finding room for improvement. "We are capitalizing on the inefficiencies that industry has grown into during the fat years."

The Wheelabrator case history book tells the story. Among others: A large automotive foundry is saving about $1100 per day over former methods. A large forge shop is saving about $1000 per month. An outboard motor maker is saving $500 per month.

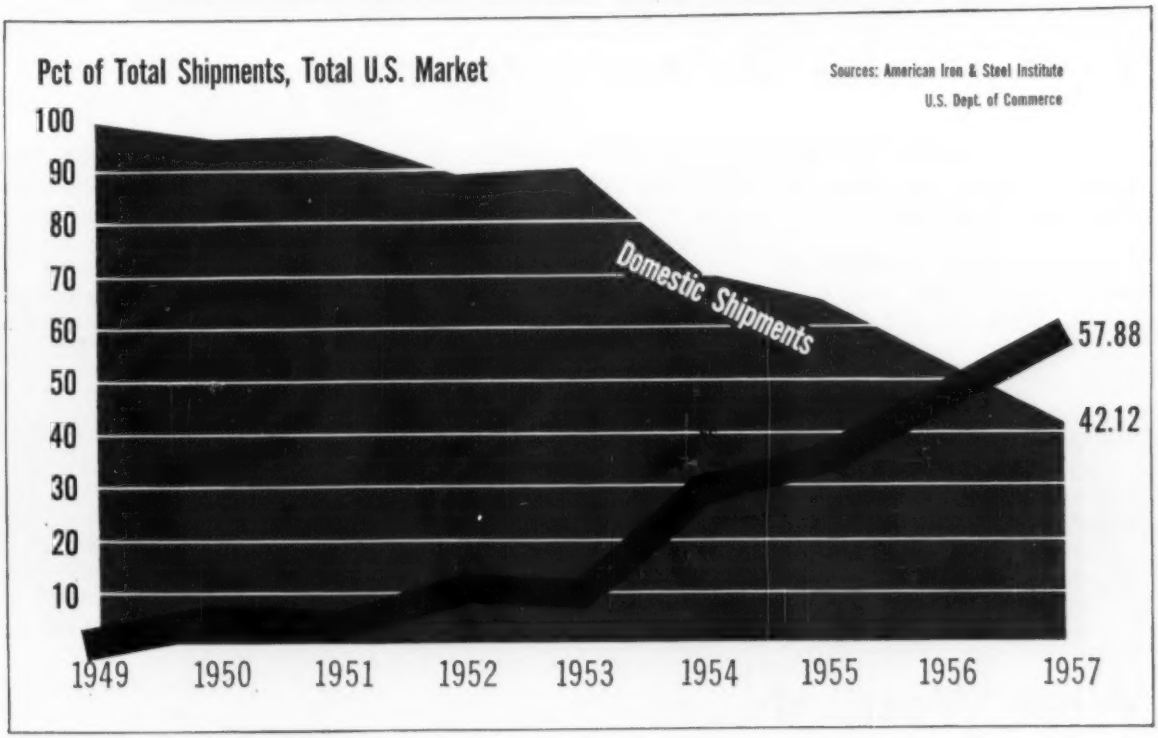
The Key—Much of Wheelabrator's newly won reputation for helping the customer cut his costs is based on devising more efficient methods. Sometimes a switch to steel abrasives is the key.

But mostly, it's a combination of the two factors, says Mr. Pfaff. "If our steel abrasives are put into an inefficient operation they never demonstrate their full capabilities, and may even prove uneconomical. But when blast cleaning operations are properly controlled, our product always shows a savings."



BLAST OFF: Cleaned sheet emerges from the four-unit Wheelabrator blast machine at Canadian Car & Foundry Co., Ltd., Montreal, Canada.

How Imports Hit Barbed Wire Producers



Is Wire Import Threat Easing?

• Is the import pressure on domestic producers of merchant wire relaxing?

There are signs it may be easing for the moment, but the long-range outlook is not hopeful. Currently domestic suppliers are encouraged because importers are quoting few deliveries beyond September.

One U. S. mill says foreign competitors are soft-pedaling shipping promises for October and the rest of 1958. A wire importer says he could line up some American orders, but can't get enough to fill shipping space from abroad to Great Lakes ports before the winter freeze closes in.

Delivery Ease Absent — European wire producers are somewhat hamstrung because they can't deliver here with the ease they quoted earlier this year. At present European mesh, nails, and barbed wire are booked solid for October and pretty well filled for November and December. European reinforcing bar is equally well booked. Wire rod from overseas is still available, but order books are fattening fast.

Importers admit that their shipments in the first half of the year were not very good. But the same poor market hurt domestic producers. And the importers look for some improvement during the rest of '58.

Price Dilemma—Even with the current easing in foreign pressure the domestic mills are concerned about their prices. Recent steel price advances have left U. S. wire mills with a dilemma: To raise or not to raise merchant wire prices? American Steel & Wire Div. of U. S. Steel boosted galvanized and annealed merchant wire. Other mills have been slow to follow.

In addition, the import dropoff is scheduled for the fourth quarter—not a good merchant products season in any year. And there's still foreign competition in 1959.

Despite their temporary breathing space the domestic mills expect more trouble from foreign competitors in 1959. "It's pretty obvious they'll be coming back," says a market research man for a U. S. producer. "Europe doesn't consume barbed wire. The mills there were built to make a product to sell here and in other consuming points, all outside Europe."

Electric Labor Asks for SUB

But Westinghouse Talks Open on Friendly Note

Both the company and the union are taking a firm but cordial stand on the SUB issue.

Neither would welcome a strike such as they had two years ago.—By G. J. McManus.

▪ With surprisingly little fanfare, labor talks in the electrical industry began last week when Westinghouse Electric Corp. received union demands for SUB (supplementary unemployment benefits).

Demands were presented by International Union of Electrical, Radio & Machine Workers, AFL-CIO. They came as part of an 8-point package that takes in subcontracting, automation, severance pay and others.

General Electric Co. will get similar proposals later this month.

Oct. 15 Deadline—Some 100,000 are represented by IUE at General Electric; the union claims 40,000 members at Westinghouse. Smaller groups, represented by UE (United Electrical, Radio & Machine Workers), will push for their own SUB plans.

The unions are reopening five year contracts under provisions that allow consideration of employment security matters after two years. The GE contract give the union the right to enforce its demands with a strike after Oct. 1; the Westinghouse pact sets Oct. 15 as the strike deadline date.

New Demands — IUE is asking SUB benefits equal to 80 pct take-home pay or 65 pct of gross pay. The union wants 52-week benefits and supplementary pay for men on short work weeks. It would allow one year for the fund to build up but seeks a lump sum fund for current unemployment.

IUE sets the cost of the program at 3 pct of payroll. It approaches negotiations "with the utmost seriousness and with the determination to secure . . . protection against the ravages of unemployment."

How They Size Up—Westinghouse has carefully avoided any positive statement on SUB. It was quick to deny published reports that it would grant unemployment pay in some form. It points out that its wages have jumped 17 pct since 1955. It feels it is already paying higher wages than GE.

But both Westinghouse and its union still remember the bitter strike of two years ago. The company is in the middle of a big program to improve labor relations. IUE is in a particularly unhappy position for a strike.

The General Electric situation may be a little different. GE has made no bones about the fact that it will resist SUB. Some labor observers feel this stand is merely a tactical maneuver, that the company is resigned deep down to some form of jobless pay. But GE has reportedly issued a sharp rejection of this theorizing.

What Westinghouse IUE Union Wants

SUB: Full year payments of 80 pct of take-home pay or 65 pct of gross pay

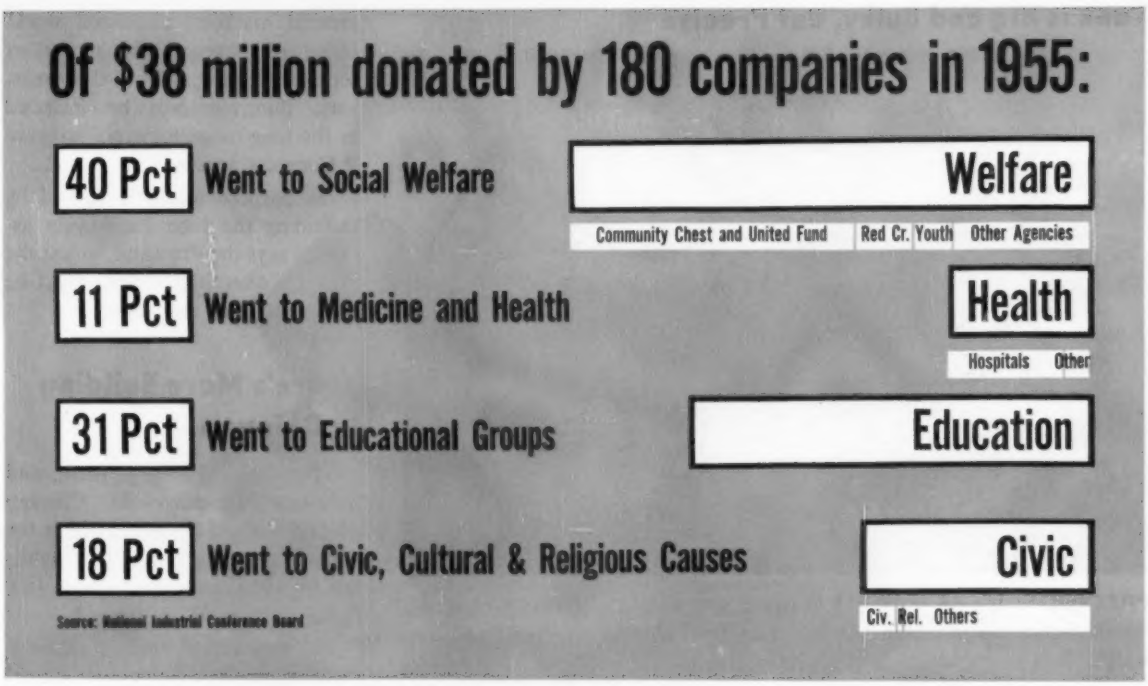
Severance pay: One week's pay for each year of service

Mobile seniority: Seniority protection for workers whose job is transferred to another plant.

Sub-contracting: Limitations on right of company to farm out work

Automation: Formation on company-union committees to consider automation plans and decide on employee protection

Other: Reduction of work week; elimination of sex and area wage differentials; scheduling that spreads work.



Industry Keeps Eye on Its Giving

▪ Business giving continues to grow, but on a more carefully planned basis, a new survey by the National Industrial Conference Board reveals. Corporate philanthropists are closely studying the areas of need and the agencies which serve these needs. Gift patterns are being adjusted in the light of these studies.

For example, industry aid to education has risen sharply during the past ten years, reflecting industry's awareness of its stake in the well-being of colleges and universities.

Who Gave What—Regard for others, is not the sole motive in company donations, NICB finds. Company policy usually requires that supported causes have some relation to the needs and interests of the business. Immediate direct benefit is not always demanded, but the company must profit in some way, even if the profit is long range or broadly based.

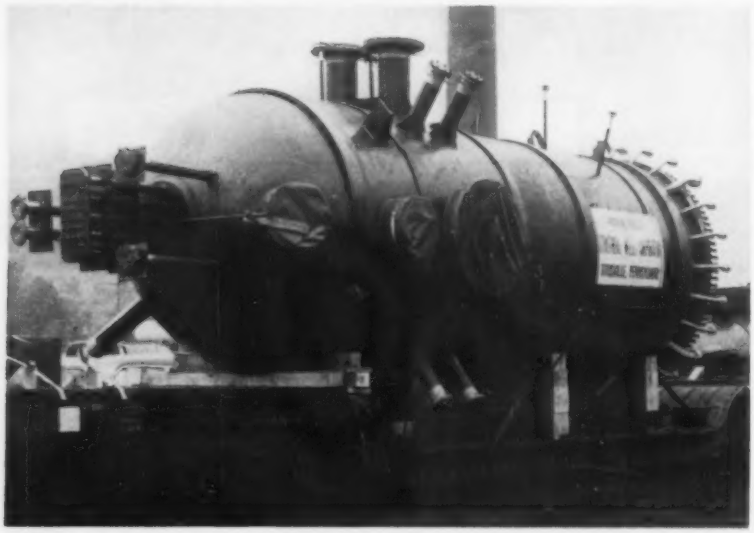
In the NICB survey 180 firms were questioned with 163 reporting a total 1955 net income of $5.1 billion and donations of $37.9 million, or an average of 0.7 pct of net income before taxes as gifts. Wide variations exist among the reporting companies—donations ranged from 0.1 pct in several to 9.1 pct for one machinery firm. NICB reports that company contributions vary inversely, with larger firms giving a lower percentage of earnings than smaller companies.

Non-Included Help — But percentages don't tell the whole story. The gift total of $38.3 million for the 180 companies does not include administrative costs, donations of company products, facilities and equipment, public service advertising and the like. Important here is the company time donated by executives and other personnel. Twenty-three companies having assets of $100 million and up estimate time spent by personnel in philanthropy is worth an average 0.29 pct of their income before taxes.

How It's Budgeted — Donations are not usually made haphazardly, NICB reports. Most corporations have built yardsticks to determine how much they will give and to whom. No single factor governs the amount given, but three important elements are: (1) amount of earlier contributions; (2) recommendations within the company; and (3) earnings before taxes. Over half of the firms studied use a contribution budget. In addition to fixing a limit on gifts, the budget aids in studying trends, analyzing the scope of donations, forecasting cash needs, and comparing costs.

Requests for money are normally handled by an individual or a committee, working with a foundation where one has been set up.

Tank Is Big and Bulky, But Precise



PRECISION: It's 35 ft long, 9 ft diam, and weighs 140,000 lb, but this stainless-clad, carbon steel tank has been fabricated to tolerances of a fine watch, on a larger scale. It is a pressure vessel for the National Advisory Committee for Aeronautics atomic reactor at Plum Brook Research Station, Sandusky, O. When lowered into its position, its 68 openings of various kinds will precisely match their pipe mates. It was manufactured by Struther Wells Corp., Titusville, Pa.

Free World Eases Red Trade Embargo

The Free World is easing restrictions on trade with the Communist countries.

American officials are still a month or so away from deciding which goods they will permit to be shipped to the Sino-Soviet Bloc, and which to restrict. The new U. S. embargo list will have some additions. In total, American businessmen will not be as free to ship to the Reds as will exporters in other foreign countries.

List Cut — Commerce Secretary Sinclair Weeks says the revisions in the so-called "positive" list—items which may be shipped to the Satellites only under special license—will be reduced from its former 992. But new additions, particularly in electronics and chemicals, will eat up part of the reduction.

The U. S. will not lower its complete embargo against shipments to Communist China, North Korea, and North Viet-Nam.

The lowering of Red trade bars negotiated by the U. S. and 14 other nations, immediately brought permission for businessmen in the other countries to ship many types of machine tools, ships, trucks, small locomotives, small electric generators, ball bearings, copper and aluminum, etc., to the Reds.

U. S. officials say they don't expect any sharp increase in trade between East and West, principally because of the Reds inability to pay.

Purchase Bill Vetoed

President Eisenhower recently vetoed legislation which would have extended for another year existing government purchase programs for asbestos and fluorspar.

He listed among his reasons for the veto:

The program has not reoriented the domestic acid-grade fluorspar producing industry to normal commercial markets; additional stockpiling of fluorspar would further separate producers from their markets; fluorspar will be included in the long-range minerals program if Congress approves it.

No purpose would be served by extending the time for buying asbestos, says the President, unless the limit on quantities which could be purchased was also hiked.

There's More Building In Chicago

The outlay for new plant and industrial buildings in Chicago zoomed to a $45 million high for July. It's the highest monthly outlay in 1958 and the highest July figure since 1950.

At the same time, residential building in the six-county Chicago area rose to $52 million, as permits for 3,407 new homes were issued during July. This is the first month in 1958, in which residential starts have exceeded the same month last year.

Industrial Surprise—The residential upturn was something less of a jolt than the sharp gain in industrial building outlays. Housing starts, nationally, have been moving up since February. In the first seven months of 1958, the steadily climbing rate of new starts has boosted 1958 building levels to 5 pct ahead of 1957. Bureau of Labor Statistics now reports the nation is building new homes at a seasonally adjusted 1,160,000 per year rate.

Private residential construction usually falls off in July. It rose in July this year.

Metalworkers figure strongly in Chicago's unexpected industrial building spurt, with Inland Steel, Linde Air Products Co., Hoffman Electronics, Hubbard, Laystrom Manufacturing, All-Weather Steel Products Corp., contributing to the gain.

July boosts 1958 industrial building in the area slightly over the first seven months total for last year.

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This man is tabling downtime indefinitely with SKF's new steel pillow blocks

He's cutting bearing maintenance to a minimum yet drastically reducing the chances of table downtime! For he's equipping the mill tables with SKF's new SMT Steel Pillow Blocks with self-aligning spherical roller bearings.

The split construction design of these new pillow blocks makes it possible for rolls to be removed without disturbing base alignment. The non-rubbing, labyrinth-type seal effectively keeps out scale and water and is not affected by high temperatures.

The Type "C" Spherical Roller Bearing gives him the highest capacity available in any self-aligning roller bearing. This high capacity is available despite angular misalignment caused by heat warpage of the table structure or other factors promoting table misalignment.

He'll save with direct, center lubrication, too . . . because a lubricating groove is provided around the circumference of the outer ring of SKF sphericals with equally spaced holes drilled in the ring connecting the groove to the center of the bearing. Grease moves around the groove and through the holes which channel it directly to the center of the bearing.

Why not make the change-over to SKF Steel Pillow Blocks yourself? Write for Catalog #447.

7821

Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

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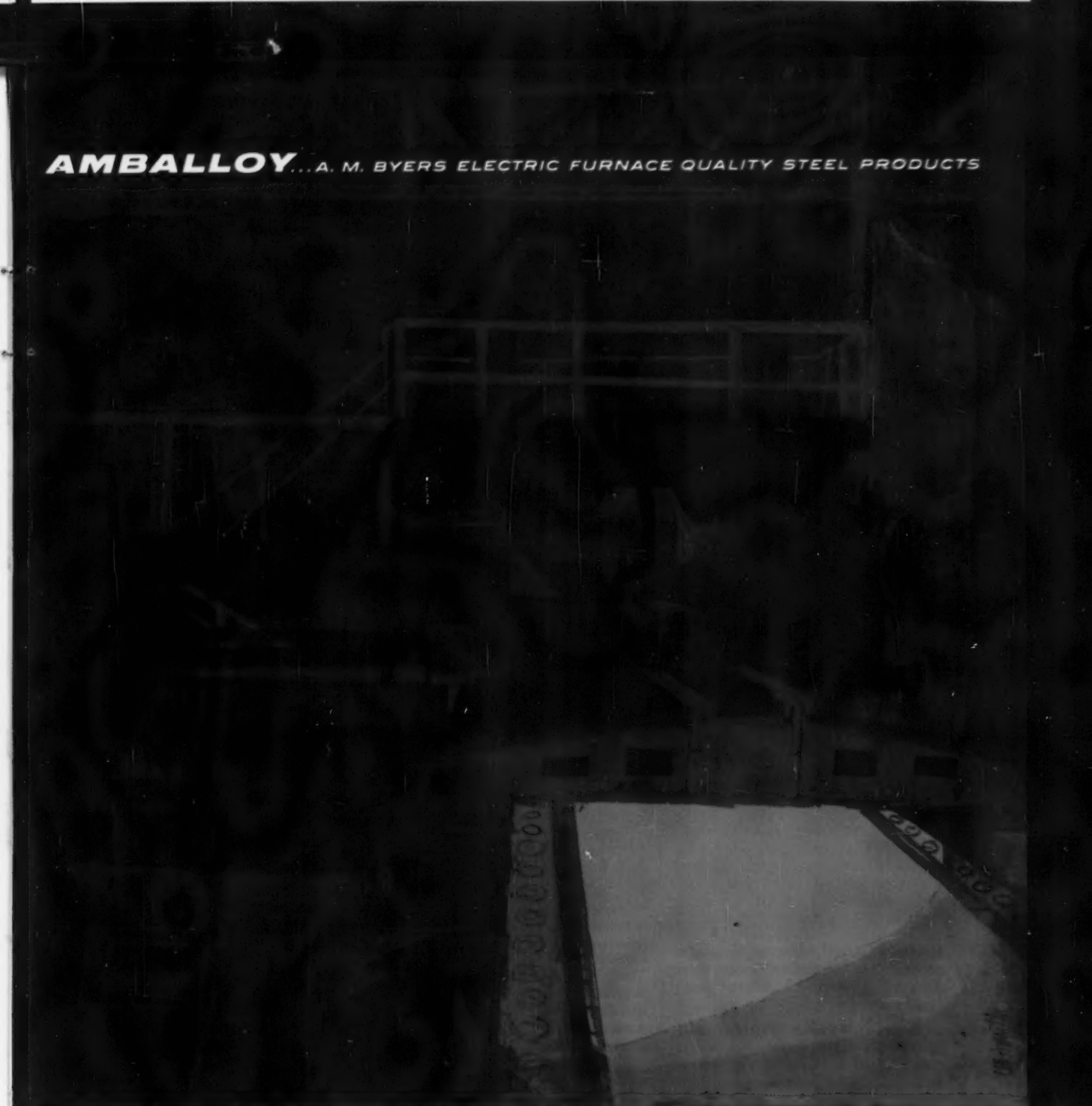

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Facts to consider when you're buying

Chromate Conversion Coatings

for Corrosion Protection, Paint Base, Decorative Finishing

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002″ max.) gel-like, complex chromate film of a nonporous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

If your company is manufacturing or buying parts or complete assemblies made from or plated with any of the more common non-ferrous metals—zinc, cadmium, aluminum, magnesium, silver, copper, brass or bronze—you've probably already run up against the question of finishing these surfaces with a chromate conversion coating. These coatings are used to protect against corrosion, or to provide a base for paint or to provide a decorative finish for sales appeal or shelf life. Since chromate conversion coatings represent a relatively new means of obtaining these finishes, this digest of facts to consider may be of value to you.

1. THE COATINGS THEMSELVES. There are many brands on the market. All are similar in many ways. Each, of course, offers its own specific advantages and these may relate to operating techniques, performance under actual use conditions, cost, availability, etc. Naturally, you'll want to choose a coating that is widely known and accepted under both military and civilian specifications.

2. THE COMPANY BEHIND THE PRODUCT. Is it a reliable, established organization? Does it offer experienced technical service, both from the field-engineering organization as well as the home office and laboratories? The man who sells and services your installation should be thoroughly familiar with not only chromate conversion coatings and their applications, but also with the characteristics and performance of related finishing operations such as precleaning, electroplating, painting, etc. This is most important since all steps of the finishing cycle must be functioning properly for the satisfactory performance of the ultimate finish produced.

3. AVAILABILITY OF THE PRODUCT. Ideally, of course, the material should be readily available to you from nearby warehouses to avoid time loss in long distance shipping and to provide emergency service, should the need arise.

4. COST. Naturally, the initial price of the material is important to you. However, just as you consider ultimate cost when you are buying mechanical equipment, ultimate cost must be considered for these finishing chemicals. So, it will pay you to investigate consumption costs, labor costs and the other factors which go into the determination of ultimate cost. Further, cost alone gives no indication of product performance, so careful attention must be given to the purpose the finish must serve and the value that finish will add to your product.

5. FACILITIES FOR RESEARCH AND DEVELOPMENT. Perhaps the existing types of chromate conversion coatings do not include a compound that will accomplish exactly what you wish. Then, it is important to deal with a supplier who has adequate research and development facilities available to work with you to produce a material to meet your needs. Naturally, such a project is seldom completed overnight. But, with complete cooperation and confidence from both you and your supplier, chances are a satisfactory program can be completed.

These are the concepts of sales and service on which we, Allied Research Products, Incorporated, have developed and marketed the line of Iridite chromate conversion coatings . . . superior product performance, complete sales and technical service, easy product availability, economical cost, extensive research and development facilities. No doubt you are familiar with our line and have seen this trademark—

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—in our advertising, technical literature or on shipping containers in your plant. Remember this trademark when you're buying or investigating chromate conversion coatings for your company. It's your assurance of quality, economical products from a reliable and established company, skilled sales and technical service from both our home office and a national network of representatives, immediate availability from warehouses in strategic industrial areas and our willingness to work with you to develop new finishes to meet your needs, should the present line fall short.

For complete information on Iridite chromate conversion coatings, write today for your free copy of our technical data file. Or, for immediate advice, call in your Allied Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

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C. Allan Brady

How a Missile Man Got That Way

Some critics say automakers shouldn't be in the missiles business because they lack experience.

Chrysler's Al Brady and the Redstone missile program provide the answer.

▪ Before missiles became popular C. Allan Brady considered travel and hunting as his hobbies. Today, hunting has changed to Huntsville, Ala., site of the Redstone Arsenal, and traveling has become a gruelling 100,000-mile-a-year part of his job as general manager of Chrysler Corp.'s Missile Div. It's Mr. Brady's responsibility to see that maximum effort is exerted in the division's Redstone and Jupiter missiles production.

He speaks of the Redstone missile with confidence. "We can set a firing date, ship the bird, set it up, and at the appointed launching time —bang, off it goes."

Strives for Reliability—The consistent success of Redstone missile firings has impressed other missile makers who often encounter long delays before firings.

Says Mr. Brady of Chrysler's missile program: "This is no gypsy camp. In the missiles business, the reliability factor must be high—everything has to work right the first time. We've been able to do it on a production basis with the Redstone."

His present goal is to achieve the same production reliability for the 1500-mile-range Jupiter.

The Group Approach — In his Detroit office, a long, low table is usually occupied all day long and into the evening by groups of engineers working out special problems. Among the arguers are many eminent names in the missile field.

C. ALLAN BRADY: The reliability factor must be high.

During these discussions, Mr. Brady usually says little and listens a great deal. As one engineer describes it: "The boys get pretty excited at times and almost forget Al is there. When it's all over, Al just says quietly 'This is the way we'll do it.' "

Getting Into Orbit—Al Brady joined Chrysler in 1926, after getting a degree in mechanical engineering from the University of Michigan.

Since joining the ranks of missilemen in 1952 as chief liaison engineer of the Missile Branch, he has been an extremely busy executive. His Redstone missiles carried the first U. S. Explorer satellites into orbit.

While missiles were zooming through space, Al Brady was doing plenty of traveling of his own on the ground. In all of last year there were only two weeks in which he didn't leave town on an urgent mission.

Explains Mr. Brady: "The only acceptable thing in the missile business is maximum effort." His primary rule has paid off for Chrysler and the U. S. missile effort.

how to rustproof cold rolled steel in shipment and storage

Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4805 South Whipple Street, Chicago 32, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.

How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

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Are We in For More Inflation?

Whatever the over-all trend, it may not necessarily apply to your industry.

A key barometer to watch is the wage cost experience of your suppliers.

▪ It might be a good idea to do some thinking on whether inflation will be a factor in your business during the next year.

Most economists seem to be of the opinion that the inflationary spiral has lost some of its steam. But whether or not things turn out that way, you should keep in mind that the opinions expressed are based on an appraisal of the over-all economy.

You May Be Different—What will happen in your own industry may be entirely different from the general trend.

In metalworking—for the moment, at least—competitive forces are tending to hold prices down. But as business improves, the price trend could very well be upward.

What to Watch—The steel price increase was a modest one considering the size of the employment-cost boost shouldered by the mills. And the effect of the price hike on products made of steel will be minor in relation to the final cost of those products. But the effect is still inflationary. You have to take it into account in figuring whether your materials costs are likely to go up.

Still, the basic thing to watch is the labor costs of your suppliers. It's one thing for a supplier to absorb the cost of a steel price increase, but if his own labor costs rise drastically that's a horse of another color. Competition may force him to forego or limit price adjustments for the moment, but when competition eases he's got to hike prices in self-defense. The cumulative effect of such increases is what adds up to inflation in the particular industry you happen to be in.

The Trend in Metalworking—Over the long term it's a safe bet that the trend in metalworking will continue to be inflationary.

The reason for this is that organized labor still has the power to obtain further concessions from industry for its members. And labor leaders will continue to press for these gains at every contract renewal. The best industry can hope for is that these perennial wage cost increases can somehow be held to a level equal to productivity increases. And that's questionable.

How Buyers Find Business

Prices Hold Steady—Commodity prices continue to hold relatively stable, according to the July survey of members by the Purchasing Agents Assn. of Chicago.

While the percentage of buyers reporting higher prices for principal items was 16 pct in July compared with 7 pct in June, the increases were largely attributed to price boosts in some nonferrous metals.

Inventories Are Tight—For the most part, purchasing agents are clinging to a tight inventory policy. If there is a trend toward increasing inventories, it was barely apparent in July. Some 15 pct of buyers reported higher inventories, compared with 13 pct in June. But a substantial 32 pct say their inventories are smaller.

The difference that a year can make in inventory policy is apparent. In July 1957, some 55 pct of the buyers said their inventories were higher, 43 pct were the same, and only 2 pct were lower.

Backlogs Are Up—Order backlogs improved slightly during July, according to the survey. Some 33 pct of the purchasers reported their order backlogs were larger, compared with 27 pct in June.

A good many businesses are still pinched from a profit standpoint. Last month, according to 39 pct of the buyers, profits were lower. Forty-seven per cent said they were the same, and only 14 pct reported higher earnings.

Our Built-in Stabilizers

The National Industrial Conference Board reports on how built-in stabilizers helped cushion effect of the recession on payrolls.

The Board says that wages and salaries, seasonally adjusted at an annual rate, fell by $8 million between August '57 and May '58. But the net drop was only $3 billion due to a rise of 135 pct in unemployment benefits, accounting for $2.6 billion, and increased old-age, survivorship, and disability benefits, which accounted for $2.4 billion.

AUTOMOTIVE

Aluminum Nibbles at Auto Market

Kaiser Predicts More Gains for Aluminum in '59

Industry is shooting for heavy tonnage gains through wheels, engine blocks, bumpers, and radiators.

Ford, GM, and Chrysler cars will use more in upcoming new models.—By H. R. Neal.

▪ Aluminum consumption by the automobile industry is slated for another increase in 1959. Given a good break on automobile sales, auto industry will use nearly 50 pct more aluminum than in 1958. This prediction was made by V. E. Flaherty, automotive industry manager of Kaiser Aluminum & Chemical Sales, Inc.

But even without any substantial increase in auto sales, the prospects appear brighter for greater aluminum consumption in the coming year. A company-by-company survey of the industry, conducted by Kaiser Aluminum's market research staff, indicates that average amount of aluminum in new models will increase 14 pct over 1958 cars.

Average Per Car—Average usage per car will be 57.1 lb, as compared with 50 lb in 1958 and 46.3 lb in 1957, according to the report. **These aluminum poundage figures and others in the survey include scrap generated in manufacturing.**

Kaiser's Mr. Flaherty views the 1959 trend toward more aluminum as "particularly significant in light of predictions that 1959 will be a good year for the automobile industry."

A Look Ahead — Making the most optimistic production forecast to date—5.9 million cars—he says this will require 337 million lb of aluminum compared with an estimated consumption of 228 million lb by the industry in 1958.

Looking ahead a few years, the Kaiser executive sees a veritable aluminum bonanza as many long-rumored applications of aluminum are put into production:

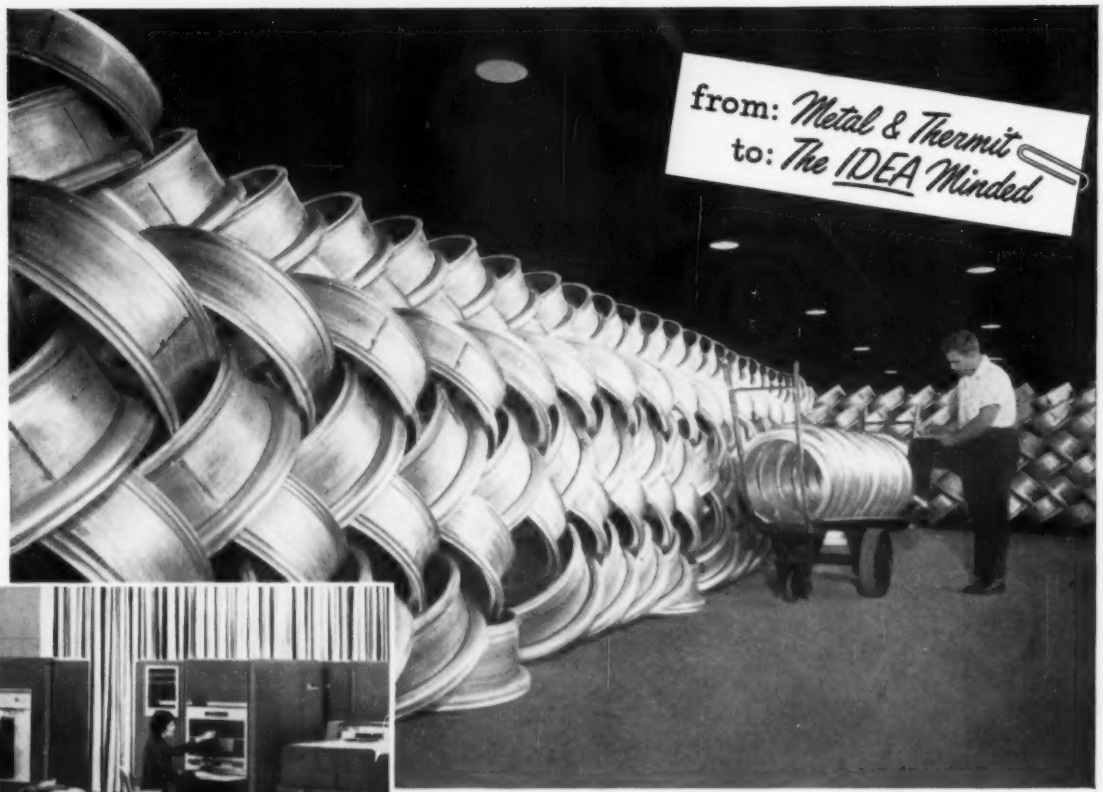
More to Come—"The outlook grows ever brighter as we project our calculations in the early 1960's when the use of such major new aluminum components as engine blocks (The IRON AGE, July 3, 1958), wheels, bumpers and radiators is expected to be realized.

"Cast applications, engine blocks and wheels in particular, represent tremendous potential volume. We estimate that by 1962 an additional 200 million lb of aluminum will be required for castings. This means a total of some 72 lb of castings per average car. This will more than double the 1958 usage for this purpose."

Ford's Use Climbs—While large

Electronic Sniffer Goes to Work at Chrysler

"NOSE" FOR LEAKS: This electronic "sniffer" detects minute leaks in air conditioner lines on Chrysler's Imperial. Escaping refrigerant actuates alarm buzzer, alerting inspector to check for leak source.



Dense copper deposit helps make a "brain" bright

Since a good memory is vital to computers, IBM plates memory cylinders with the Unichrome Pyrophosphate Copper Process. The deposit from this bath shows an exceptionally smooth, dense deposit of uniform structure.

For the same reason, electronics manufacturers use it in printed circuits. Metallurgists specify it for masking or "stop off" work in nitriding and carburizing operations, since it makes a more impervious shield with thinner deposits. Send for data on M&T's complete line of copper plating processes.

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Only 70¢ worth of material protects all these rims

Zinc plated truck wheel rims are chromate treated with a Unichrome Dip Compound at CLEVELAND WELDING DIVISION, AMERICAN MACHINE & FOUNDRY COMPANY. A mere 70¢ worth of this material in solution was sufficient to treat all the rims visible in the picture above for extra corrosion resistance and a better base for paint.

Metal & Thermit offers one of the widest lines of chromating materials now available. Send for handy "Pick-a-Dip" chart.

Plastisol seals out corrosion

Unlike plastic sheets, Unichrome "Super 5300" Plastisol poses no seam problems in lining tanks. It sprays on. It therefore protects even sharp bends and complicated shapes. This vinyl compound bakes to a seamless, pore-free coating that maintains a tight "seal" under severely corrosive conditions.

Thicknesses of up to 60 mils per coat can be achieved by spraying . . . in-plant, or at the facilities of applicators in key locations. Send for data.

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Automotive Production

WEEK ENDING	CARS	TRUCKS
Aug. 16, 1958*	60,380	13,148
Aug. 9, 1958	65,614	15,441
Aug. 17, 1957	117,598	20,001
Aug. 10, 1957	118,864	18,279
TO DATE 1958	2,701,598	544,745
TO DATE 1957	4,149,505	719,593

*Preliminary Source: Ward's Reports

motor block and wheel castings are expected to provide the next big jump in auto industry aluminum usage, Kaiser's market research survey reveals present increases are due "primarily to more liberal use for moldings, trim areas, and increased use in optional equipment."

Ford Motor Co. products as a group, the report says, will show the largest advance with an average 17 pct increase per car. This means an increase to 53.8 lb from the present 46.2 lb.

Ford shows the largest increase, up 20 pct from 41.9 lb to 50.9 lb, but still uses less than other Ford products. Lincoln uses the most at 91.8 lb, but this a 6 pct decrease from 97.7 lb found in its average 1958 models.

Where GM Stands — General Motors cars, paced by Chevrolet's use of 21 pct more aluminum, have taken over as second largest user of aluminum per car. The amount of aluminum required for the "average" 1959 GM car is going up to 54.1 lb, a 14 pct increase from the present 47.3 lb, according to Mr. Flaherty.

The new Chevrolets, while showing the largest individual percentage gain and using an average 42.3 lb of aluminum as compared with a current requirement of 34.9 lb, still use less aluminum on the average than any other U. S. passenger car except Studebaker-Packard Corp.'s cars. Composite S-P cars are unchanged for 1959 with 26.2 lb of aluminum each.

Chrysler Average Highest—As in 1958, Chrysler Corp. automobiles will employ the highest per car average with 73 lb, an increase of 6 pct. Imperial, despite a 3 pct drop in usage, will still lead all automobiles with an average 131.5 lb per car. However, the Kaiser report points out, some top luxury models will use considerably more.

American Motors Rambler will use 1.5 lb less aluminum than in 1958 at 53.4 lb, a 3 pct drop, and is one of only three makes scheduled to use less of the light metal per car.

Castings Gain Most—Increasing role of cast components is indicated in the forecast of 1959 model consumption of aluminum mill products, Mr. Flaherty says. Castings are expected to show a gain of 15 pct in 1959, as compared with an 8 pct increase in 1958. Wrought products such as extrusions and sheet, on the other hand, indicate an advance of only 10 pct, as against 53 pct in 1958.

It Pays to Build Small

Vehicle sales in July made encouraging news at some manufacturing companies. Willys Motors reports factory sales of "Jeep" vehicles were the highest of any month in 1958, 40 pct above the previous peak month of June. At the same time, retail deliveries kept pace by exceeding the June retail sales by 55 pct.

American Motors' Rambler retail sales in July topped the June record by 19 pct and were 155 pct above total deliveries in July a year ago. Some 17,679 Ramblers were sold in July, compared with 14,876 in the previous month and 6930 in July, 1957.

AMC says sales in the fiscal year which began Oct. 1, 1957 totaled 130,511 at the end of July, up 75 pct over the 74,561 Ramblers sold in this same period a year ago.

Danger From Behind

For the fourth consecutive year one out of every five vehicles safety-checked during the 1958 National Vehicle Safety-Check program was found in need of maintenance attention. Again, rear lights were most often found defective. Brakes, front lights, exhaust systems, and tires were next in that order.

THE BULL OF THE WOODS

YOU DON'T WANT TO GIT A STIFF POSE ON TH' LONG DRIVES--YOU GOTTA GIT POWER BEHIND YOUR SWING--LIKE THIS--NOW, SEE HERE···
RIGHT THERE IS TH' BEST GOLF PLAYER IN TH' SHOP, AN' RIGHT HERE, CLOSE TO HIM, IS TH' BEST MECHANIC IN TH' SHOP--NO CROWD AROUND TH' FINE MECHANIC!
I KNOW WHUT YOU MEAN, BUT THERE'S NO GLORY IN BEIN' A GREAT MECHANIC, ER ENGINEER! YOU'D RARELY GIT YOUR PICTURE IN TH' PAPER--RIGHT NOW, I COULDN' TELL YOU WHO BUILT TH' BROOKLYN BRIDGE, ER TH' HOOVER DAM, ER TH' FIRST AUTOMOBILE--BUT I CAN NAME YOU A DOZEN GOOD GOLF PLAYERS!
THE ROAD TO GLORY
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A MOMENT WITH MANAGEMENT...

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Cutting production costs adds directly to profit percentage. It eliminates production losses. Whether they be man-hours, machine time or material, you increase your profit spread.

A new tool is proving its ability to do just that! Many plants (large and small) have found that a total investment of a few hundred dollars actually saves them thousands monthly!

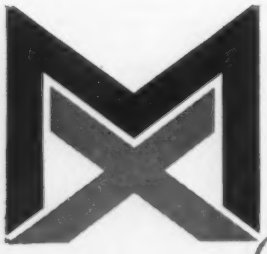
Testing is the new tool that offers immediate and future savings. It spots defects at the earliest possible moment, before a lot of money is spent working on material which can only end up in the scrap-pile.

HIGHER PROFIT PERCENTAGE will result because the returns will be increased from your present man-hours and plant investment.

THE SALES MANAGER will benefit from consistent reliable quality—increased customer satisfaction—reduced or stabilized costs—increased competitive ability.

THE PRODUCTION MANAGER will be able to maintain established quality levels (or meet new higher standards)—eliminate intermittent excessive scrapping of finished parts and often even reduce normal parts scrappage.

Can you afford to overlook these benefits? Write today for a free copy of "Lower Manufacturing Costs," an informative booklet. Or, ask our Field Engineer to discuss where and how low-cost Magnaflux Test Systems have helped others increase plant productivity.



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Weapons Will Be Campaign Issue

Democrats Blame Administration for Weapons "Lag"

Democratic - controlled House group says "web of red tape" is dropping U. S. further behind in developing new weapons.

They also have some suggestions for thumping up military research.—By G. H. Baker.

▪ Democrats in Congress are giving notice that military research management will be a primary campaign issue this fall.

The line to be followed is shown clearly in a new report by a House Government Operations group, with a Democratic majority. In it, the lawmakers blame the Administration for permitting requests for research money to fall in recent years.

Answers the Charge—An early answer to the report is a countercharge by Rep. Arends (R., Ill.), that the Democrats are dragging politics into the grave area of national security. This criticism, he says, is merely the newest attempt by the Democrats to make political gain of the nation's defense operations.

In the report, the complaint is made that the country is lagging further behind in development of modern weapons. "Research activities," it is charged, "have become enmeshed in a web of red tape that threatens to stifle the initiative and imagination of the men we must count on for our scientific advancement."

The Cure—Writers of the report present recommendations to cure the ailment they have described. One of the encouraging aspects of the new Defense Dept. reorganization act, they hold, is the provision for a director of research and engineering. The Defense Secretary then could centralize control of research and development under the new director, says the report.

Related recommendations:

Defense Dept. should carefully consider present methods of contracting for R & D to work out contract terms and practices tailored to research projects.

Organization for research and development in the Defense Dept. should embrace the idea of long range planning.

In the office of the Defense Secretary, a small unit of full-time scientists should give complete attention to the prospects for radically new weapons.

Consideration should be given, quickly, to the possibility of specialized research in ferrous metals, electronics, aerodynamics, and other vital technical areas.

Atomic Merchant Fleet

As of now, the N. S. Savannah is the only U. S. merchant vessel under construction designed to use atomic engines. But government officials think ore carriers and oil tankers of the future may be excellent prospects for atomic propulsion.

Informed estimates are that engines using atomic fuels may be competitive with present-type engines by 1965. The Savannah, to be launched next year and delivered in 1960, may be obsolete within a few years. But fleet operators could pick up data from the Savannah.

New Law Lifts Old Veil of Secrecy

New Rule—Bashful federal government officials will no longer be able to use a 169-year old law to hide their deeds—or misdeeds—from the public or Congress.

President Eisenhower recently signed legislation specifically forbidding government officials from citing a 1789 statute to withhold information and records to which the public is entitled. This does not alter the government's right to classify information for national security reasons.

Some Secrets—The President, in signing the new law, commented that the government can still keep "appropriate information or papers confidential in the public interest."

The amended law, which congressional critics claim has been used to withhold information which did not involve national security or even personal privacy, was originally enacted to help George Washington organize his cabinet, and give members control over their departments.

Under Old Law—It provided a department head should control the custody, use, and preservation of records, papers, and property. Officials have claimed this gave them the right of "executive branch privilege" to withhold any information.

Proponents of the new measure say it is a first step in ending undue government secrecy. They admit, however, it is a small step.

New Bastian-Blessing handle (shown at right) is delivered by Chase Brass in multiple lengths, to avoid waste in cutting. (Note contrast with old handle.)

Ask Bastian-Blessing

How to get new product appeal and easier manufacture

Bastian-Blessing Company has for years made a complete line of welding torches. On one of their models they used a regular brass tube which was knurled during the manufacturing process. To increase the attractiveness of this torch and minimize production problems—they developed the idea of a fluted tube.

The customer wanted a mill-drawn surface which would need no further finishing—except scratch brushing. Flute spacing had to be kept regular; interior diameter had to hold vital concentricity. The Bastian-Blessing Company in cooperation with Chase Brass & Copper Co. was able to achieve their objectives:

- **Better style—more eye-appeal.**
- **A much more comfortable and easier-gripped handle.**
- **Improved machineability.**
- **A more rugged product than before.**

PLUS—costs kept in line with the old handle!

Whatever product you design or make, chances are you can do it better with Chase Brass—alloyed from copper by Kennecott. Your nearest Chase Representative is ready to discuss your needs with you. You can reach him locally or by writing Waterbury 20, Connecticut.

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Arizona Gets Its First Steel Mill

Relocated Plant Has 36,000 Ton Capacity

Yuba Industries — confident that Arizona's steel needs will grow—is moving in a mill from California.

First tonnage of bar, re-bar, and light shapes expected by year's end.—By R. R. Kay.

• Yuba Consolidated Industries, San Francisco, is typical of optimistic Farwest metal producers. While concerned about the current metalworking dip, it is keeping the long-range outlook in view.

Yuba—confident that the steel market in Arizona will grow—is setting up the state's first steel mill.

Moving East — The company bought the 36,000-ton-per-year Western Rolling Mills, Inc., San Jose, Calif. The whole works—lock, stock, and barrel—is moving to a 140-acre site near Tempe, Ariz. Plans are underway to modernize the mill.

A full line of concrete reinforcing bars, merchant bars, and light structural shapes will be made at the Arizona site. Target date for first production is the end of this year.

Fills a Need—Yuba's Chairman John L. McGara won't disclose the sale price. But he says his company is putting $2.5 million into the project.

Arizona can support a steel mill and wants one. Consumption of merchant bars, concrete reinforcing bars, and light shapes now runs 50,000 tons per year. Area economists predict it will be 60,000 tons within a very few years. And there are some 88,000 tons of scrap to support the project.

Reasons Why—What's behind this steel mill in the desert?

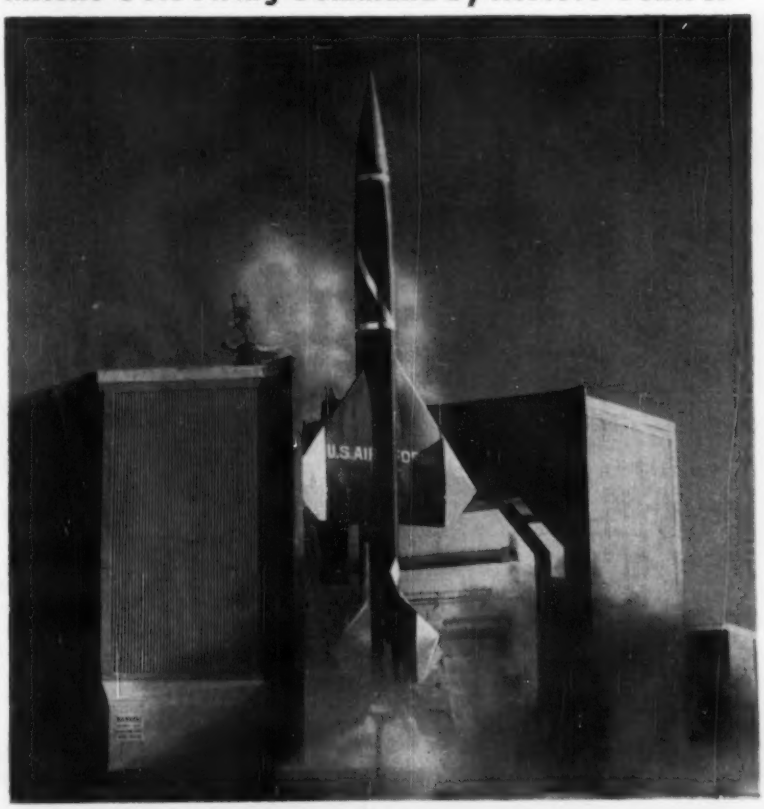
(1) Arizona's relentless population growth: A five pct increase every year.

(2) Business and industrial expansion: The parade of big-company names keeps growing. Some already on the scene are General Electric, Sperry, Motorola, Hughes Aircraft, AiResearch Manufacturing Co. New business starts since 1950 average 1000 a year.

(3) Growing demand for steel products from neighboring Mexico.

The new Arizona mill should be a good boost for the state's economy. And it looks like a good move for Yuba, too. The firm already has some handsome contracts there. Right now it's doing the steel work on the $110 million Glen Canyon Dam on the Colorado River, and on an arch bridge over the river nearby.

Missile Gets Firing Command by Remote Control

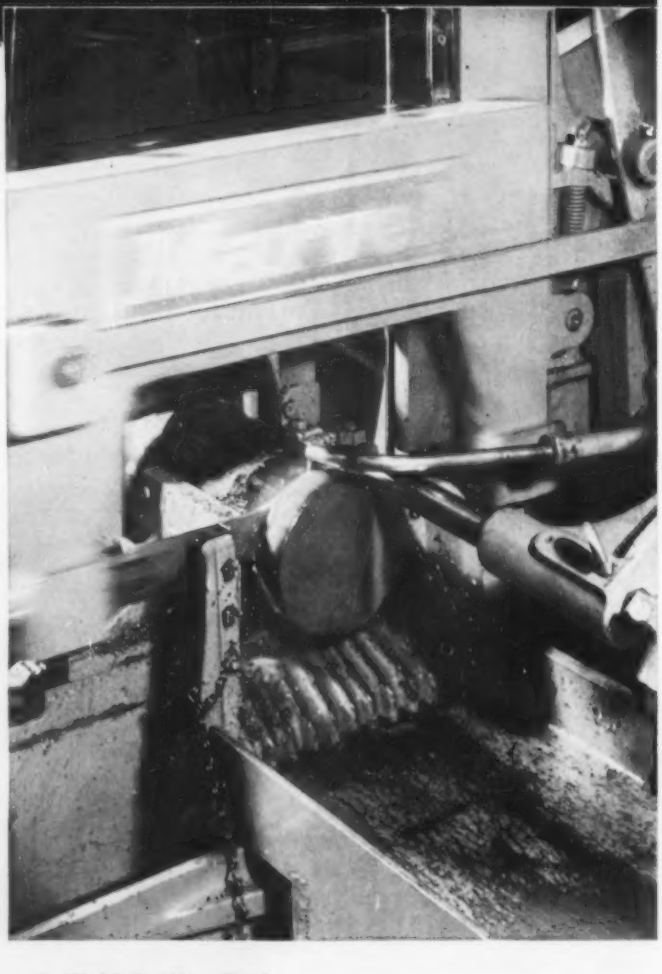


FIRST BY SAGE: Air Force's newly-developed SAGE system (semi-automatic ground environment) started recent flight of Bomarc missile by remote control. The actual firing command and intercept information was fed from a SAGE computer located at IBM plant in Kingston, New York.

5 Basic Reasons why MARVEL HACK SAWS CUT-OFF MORE ACCURATELY...

The consistently accurate performance of MARVEL Heavy Duty Hack Saws is no accident. MARVEL engineers knew, many years ago, that to produce and maintain accurate cutting-off, a hack saw must be designed and built like a fine machine tool.

Some of the basic design principles built into the modern MARVEL Hack Sawing System that makes it the most accurate cutting-off method you can use are:



1. V-Way Design...Greater Rigidity

Upright and Saddle are precision machined and fitted to form a rigid, integral unit capable of withstanding any cutting load with no deflection or side movement.

2. Anti-Friction Bearing Construction

Anti-friction ball or roller bearings are used at all load carrying points. Even the strongly braced saw frame reciprocates on heavy duty, fully enclosed preloaded ball bearings which provide permanent, frictionless rigidity and true-running, straight line cutting strokes.

3. Minimum Blade Frame Reach

Close-coupled design and crank lever action of MARVEL Saws keeps the saw frame and blade reach very short in relation to the vertical V-ways on which the unit is mounted. This insures optimum rigidity, even under the most severe operating conditions.

4. Positive Relief Blade Lift

On the return stroke, positive relief lift raises the blade to provide proper and "cushioned" lead-in on the next cutting stroke. This prolongs blade sharpness, life and accuracy.

5. Rigid Cutting Tool

Cutting-off accuracy requires a rigidly held, relatively short cutting tool. MARVEL Unbreakable High-Speed-Edge Hack Saw Blades, which combine a narrow high speed steel cutting edge permanently welded to a tough alloy steel body, can be tensioned from 200% to 300% more taut than ordinary blades. This provides a most rigid cutting edge.

Write for the MARVEL Catalog and the complete story on MARVEL METAL CUTTING SAWS

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Which Is the Right Write-Off?

Tool Builder Makes a Case for Reinvestment Depreciation

N. T. Harrison, Jones & Lamson treasurer, examines several proposals.

He explains what's wrong with others, what's right with his nominee.—By E. J. Egan, Jr.

■ Would the Reinvestment Depreciation Plan presented in Congress earlier this year bring U. S. tax-depreciation policies in line with these inflated times?

And would it also: (1) Reverse the recessionary trend, (2) stem further inflation, (3) provide a powerful weapon to combat Russian economic warfare, (4) help balance the Federal budget?

In Favor — An emphatic "Yes" on all counts comes from N. T. Harrison, treasurer, Jones & Lamson Machine Co., Springfield, Vt.

"The advocates of 'Replacement Cost' or 'Current-Value Depreciation' plans present a very convincing case," he says. But he warns such plans don't require actual replacement of old equipment.

He also discounts the value of plans that propose a five-year tax write-off on capital equipment bought this year and next.

Times Have Changed—A similar provision worked well during World War II and the Korean conflict, he admits. We needed quick expansion to survive them, he avers. But, "This is not true at the present time." He cites a survey concluding that a five-year write-off would not force a big boost in spending.

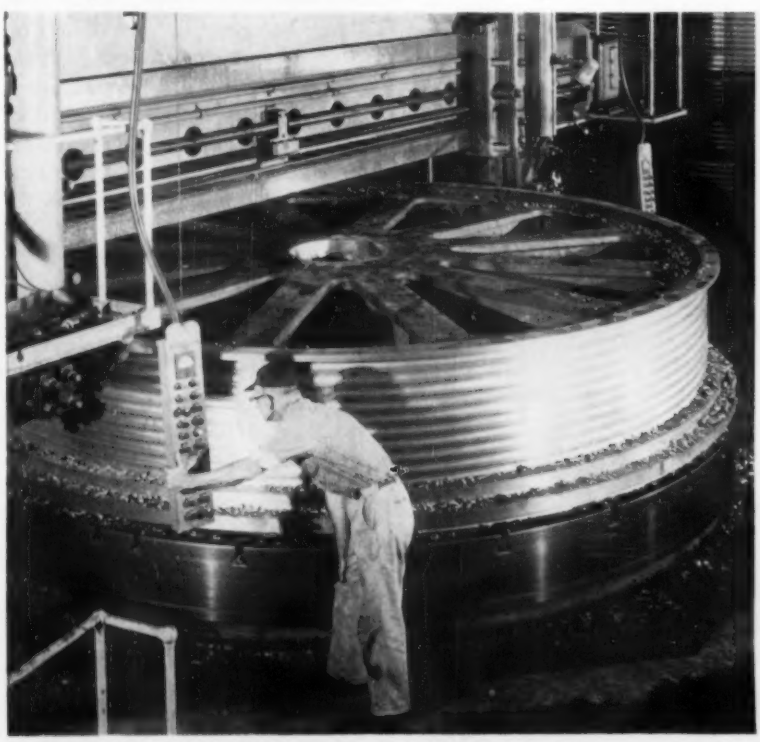
According to Harrison, reinvestment depreciation would give you a tax break in line with the replacement-cost theory. But you couldn't deduct the difference between original equipment cost and current replacement cost anytime you felt like it. You'd have to buy new equipment equal in value to this cost difference.

Advantages — "Under this plan there is no attempt to forecast replacement costs at some indefinite future date," Harrison points out. "These costs can be established only when replacements are actually made."

Nor does the plan insist that old machines be replaced by new models of like kind, he explains. For the right to depreciate your old equipment in terms of current replacement costs, you need only buy "other depreciable assets." You could replace an old drill press with a spot welder or a fork-lift truck.

Take Credit — Here's another feature of the plan that Harrison approves: If the dollars you spend for "other depreciable assets" don't equal the inflation-adjusted cost of the worn out stuff you're retiring, never mind. You can use any excess amount of adjusted cost as a credit for later years.

Boring Mill Is in the Groove



GIANT CUTTING JOB: U. S. Steel's American Bridge Div. uses a vertical boring mill to cut wire rope grooves in this 30-ton sheave.

INDUSTRIAL BRIEFS

Copperweld Expands Alumoweld—Copperweld Steel Co. has approved an appropriation of $1,325,000 for installation of new plant facilities at Glassport, Pa., for production of its new Alumoweld wire and strand.

Marketer for AZI—James E. Zane has been named Development Engineer for the American Zinc Institute with base in Detroit.

Product Engineer—William E. Pierce has been appointed to the newly created position of Manager of Product Engineering for The Porcelain Enamel Institute.

Clean Contract—Wisconsin Steel Div. of International Harvester Co. has awarded Link-Belt Co. the contract for an automatic coal preparation plant at Benham, Ky., to wash, dry, and screen 400 tons of run-of-mine coal per hour. The new plant will produce metallurgical coal for the coking ovens of Wisconsin Steel's Chicago plant.

Power For Acapulco — Nearly $3.5 million worth of General Electric power generation and distribution equipment is going into the new electric power station in the Acapulco, Mexico, vacation area.

North of the Border—The Steel Co. of Canada Ltd., Hamilton, will build a $10 million pipe plant at Contrecoeur, Que. The plant will be a butt-weld pipe mill, producing from skelp in coils a range of pipe from ⅜ to 4-inch in diameter in lengths up to 40 feet.

To The Board—Earl W. Cote, Vice President and General Manager of Webb Forging Company, has been elected to the Board of Directors of The Drop Forging Assn.

"Brains" For Missiles — The Navy has awarded a $7.4 million contract to the Ford Instrument Co., a division of Sperry Corp., for the production of guided missile computers.

A-Power to Scale — A scale model of a nuclear power plant will be a feature of an Allis-Chalmers Manufacturing Co. exhibit at an international conference on atomic energy to be held in Geneva, Switzerland, Sept. 1-15.

Chair For Barlow — Reappointment of Joel Barlow as Chairman of the 1958-1959 Committee on Taxation, Chamber of Commerce of the United States, has been announced by Chamber President William A. McDonnell.

Going Up—A $3,000,000 contract has been awarded to Westinghouse Electric Corp. to design and build what is believed will be the world's most powerful elevators. The elevators will ferry the Navy's heavy jet attack and fighter aircraft to the flight deck of the first nuclear-powered aircraft carrier, the USS Enterprise.

Silent Contract — The Missile Div. of North American Aviation, has awarded a contract to the Metal Products Div. of Koppers Co., Baltimore, for the design and construction of seven portable silencers. The silencers will be used during the testing of engines for the GAM-77 air-to-surface missile which North American is producing for the Air Force.

Cut Nail Deal—Alan Wood Steel Co. has sold its cut steel nailmaking facilities at Conshohocken to Wheeling Steel Co. Alan Wood will discontinue shipments of cut nails on Oct. 24, 1958, and orders will be accepted only until Oct. 5, 1958.

Acid Test—Production is now underway at the newly completed Good-rite glacial acrylic acid plant of B. F. Goodrich Chemical Co. in Calvert City, Ky. The new plant brings glacial acrylic acid into quantity production for the first time in this country, according to John R. Hoover, president. The new unit has a capacity of several million pounds per year.

Handling Essay—"Materials Handling — Tomorrow's Solutions of Today's Problems" is the theme established for the 1959 Clark Essay Contest, sponsored by Clark Equipment Co. The contest begins Sept. 1 and ends April 3, 1959. A first prize of $2000 and nine others totaling $3000 will be awarded best papers on the subject.

Scroll For Loewy — Erwin Loewy, a director of the Baldwin-Lima-Hamilton Corp., has been given the Air Force Scroll of Appreciation. In 1940, Mr. Loewy was instrumental in convincing the government of the importance of extrusion press installations for the aircraft industry — a critical tool which the United States lacked at that time. Through his efforts 15 installations were ready for operation by Dec. 7, 1941.

In the Balance—Bruce Adams, President of Pelouze Manufacturing Co., Evanston, Illinois, has been re-elected President of the Scale Manufacturers Assn., Inc.

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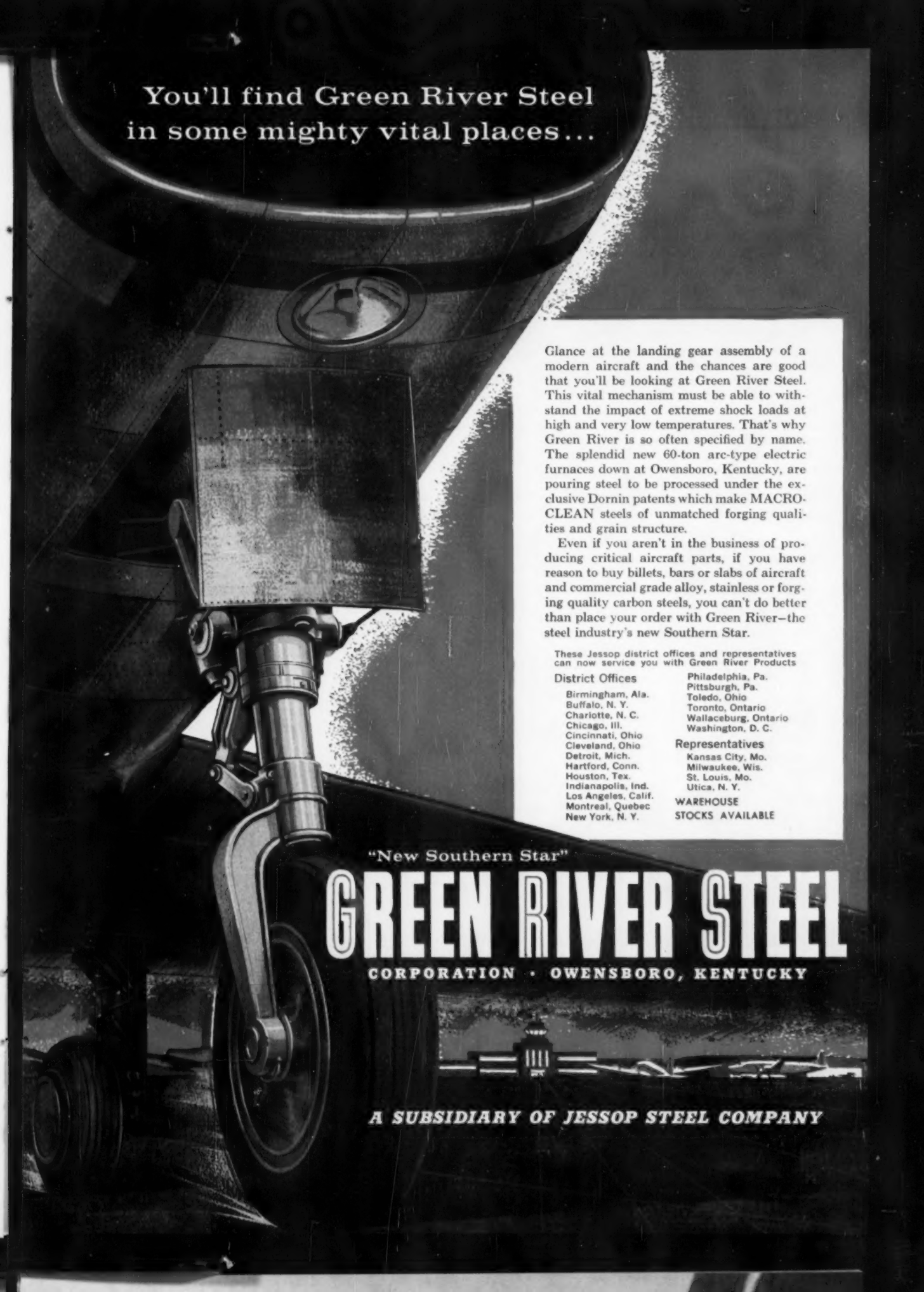

Glance at the landing gear assembly of a modern aircraft and the chances are good that you'll be looking at Green River Steel. This vital mechanism must be able to withstand the impact of extreme shock loads at high and very low temperatures. That's why Green River is so often specified by name. The splendid new 60-ton arc-type electric furnaces down at Owensboro, Kentucky, are pouring steel to be processed under the exclusive Dornin patents which make MACRO-CLEAN steels of unmatched forging qualities and grain structure.

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Dr. E. C. Herrick, appointed chemical research supervisor, Detroit Research Laboratory, Climax Molybdenum Co. of Michigan, subsidiary of American Metal Climax, Inc.

Clarence A. Price, named president, Uniloy, Inc., Saline, Mich., wholly-owned subsidiary of Hoover Ball & Bearing Co.

Arthur W. Schriewer, named Eastern regional stainless steel specialists, Chase Brass & Copper Co., Waterbury, Conn.

Robert W. Criqui, appointed production manager, Berger Div., Republic Steel Corp.

Jan Uytterlinde, appointed product manager, Baker Industrial Trucks, div. of Otis Elevator Co., Cleveland.

James S. Westwater, appointed vice president-mining, Cleveland-Cliffs Iron Co., Cleveland. Other appointments: **Hugh J. Leach** to manager of Michigan mines, **John J. Foucault** to manager of Minnesota mines, and **Stanley W. Sundeen,** manager of research and iron ore development.

William A. Clark, appointed to represent the Foil Div., Revere Copper and Brass, Inc., in Philadelphia.

Derek Richardson, appointed vice president of aluminum sales, Metals Div., Olin Mathieson Chemical Corp., New York.

Richard H. Griebel, appointed staff assistant to the manager of manufacturing, Government Equipment Div., Raytheon Manufacturing Co.

Harvey A. Clark, appointed manager of newly completed Los Angeles office and warehouse, The Stanley Works.

Hubert Fruehauf, appointed manager of the newly formed magnesium products dept., Dow Chemical Co., Midland, Mich.

Julius H. Strassburger, appointed director of research and development, National Steel Corp., Pittsburgh.

Three engineering appointments in General Electric's gas turbine dept. Schenectady, N. Y.: **Charles W. Elston,** manager of engineering for gas turbine; **Jack E. Downs,** manager-turbine engineering: **Harold D. Kelsey,** consultant — special engineering problems.

Joseph A. Cerny, appointed product sales manager-furnaces, Westinghouse Electric Corp., Staunton, Va. **Frank V. Kupchak,** promoted to manager of standards dept., Westinghouse material engineering dept., E. Pittsburgh, Pa.

George A. Bibens, named manager, Aluminum Co. of America sales office, Albany, N. Y.

William L. Vaughan, appointed manager of purchasing, San Diego plant of Solar Aircraft Co.

d'Arazien

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This shell for a Dyna-Empire, Inc. hearing aid button speaks loud and clear to *everybody* concerned with precision in screw machine parts. No larger than a penny, with walls only .006″ thick, machined to within .001″ tolerances, it proves just how precisely we put the metal where you want it.

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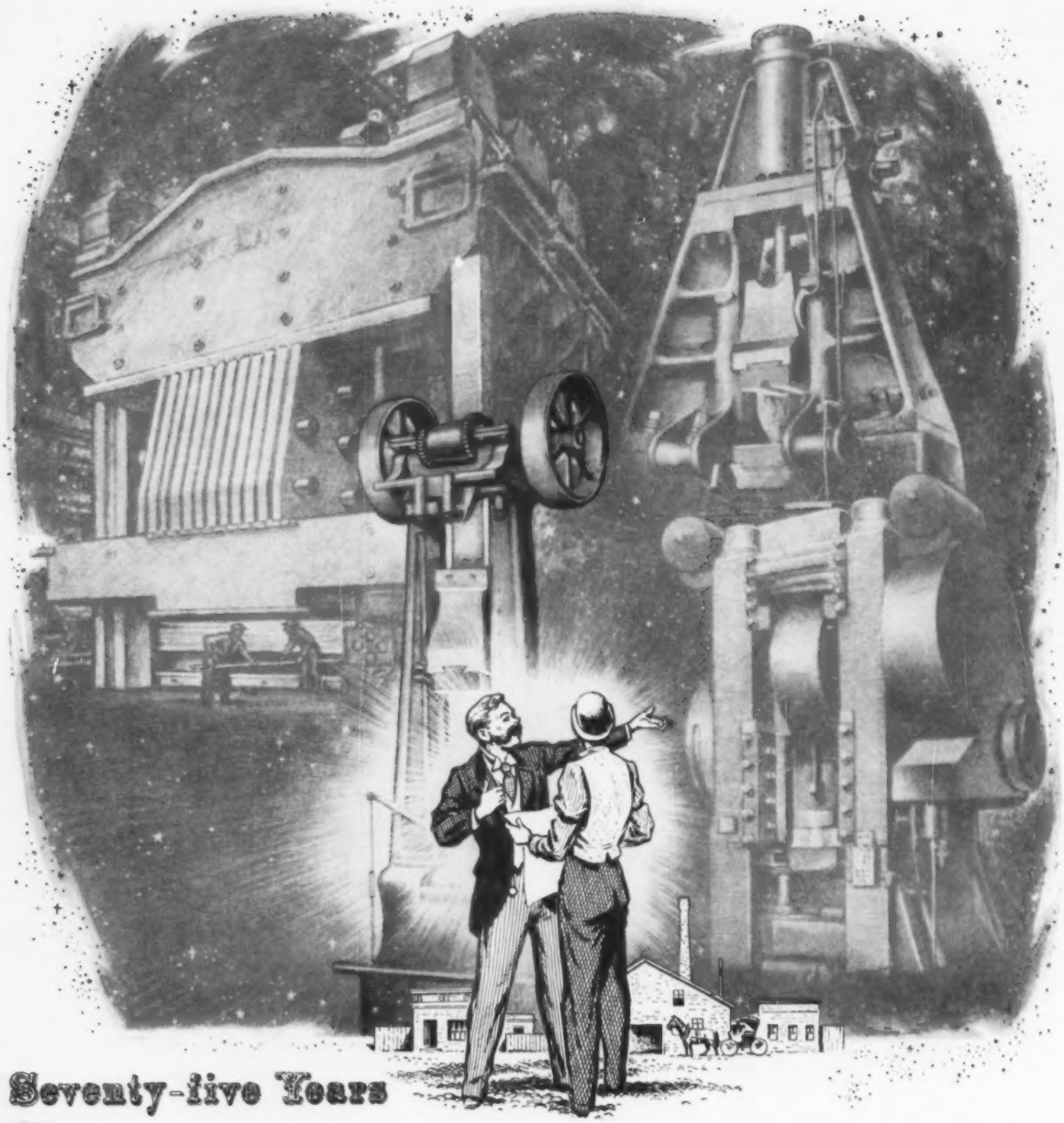

Seventy-five Years

THERE WAS a growing surplus in the United States Treasury—the Polygamy Act was passed—letter postage was reduced from three cents to two cents—the Brooklyn Bridge was opened—standard time was adopted—in 1883, when two young men, just graduated from Worcester Polytechnic Institute, established the business bearing their names—WYMAN-GORDON. The total capital was $27,000.

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On this our 75th anniversary, we salute the spirit of our founders and we pledge our every effort to help preserve, against the steady erosion of the last quarter century, that system which has made our nation what it is today and which has enabled us to build the greatest industrial production in the world, resulting in the highest standards for all segments of our people.

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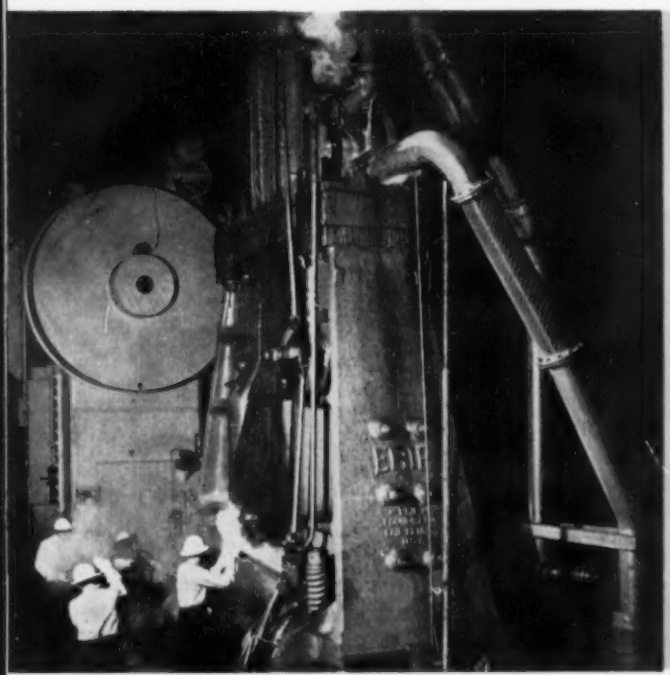


How To Get More For Your Metalworking Dollar

FORGINGS

Carbon and Low Alloy Steels

The tougher the service requirement, the more reason there is to depend on a steel forging. Steel forgings combine strength, toughness, and an almost complete freedom from hidden defects.

This feature brings into focus many of the key reasons for using carbon and low-alloy steel forgings—reasons likely to interest the purchasing agent, production executive, design engineer, and metallurgist. It reviews the principal processes by which forgings are made. It helps in choosing those available steels best suited for forging.

On the subject of costs, a special section explains just how forging costs are estimated. Included are cost factors most likely to affect the purchaser. Also covered are supplementary services offered by forging producers which can help reduce machining costs.

Without getting lost in the intricacies of forging practice, it provides a handy guide to buyers who want to buy wisely and put their forgings to most effective use.

Why Buy Steel Forgings?

Shall it be a forging or a casting? Or can the part be machined from bar stock?

Here are some of the key factors to consider in reaching a final decision.

■ Let's says we are planning to make an automotive rocker arm. We plan to make it of steel. Shapewise, it will have a relatively complex geometry. It is possible to make such a part in a number of ways.

How we decide to make it will go far toward determining whether or not we end up with a profit—and how much. It will also affect our reputation as part makers—either adversely or favorably. And it may have a lot to do with how the finished part is likely to perform in an engine.

Which Technique?—Now a rocker arm might conceivably be machined from bar stock. The scope of the machining operations involved makes this possibility unattractive. A rocker arm might be cast. It might be formed from metal powders. Or hot metal might be hammered or pressed into a shape closely approximating the finished part. In other words, it might be forged.

Which fabricating technique is most desirable? Which is likely to be most profitable?

Obviously, there are no simple answers to these questions. All final answers must be predicated on considerations of the operating requirements of the part, the kind of metallurgical quality needed, design factors, and ease of fabrication. In addition, there is the very important matter of overall costs.

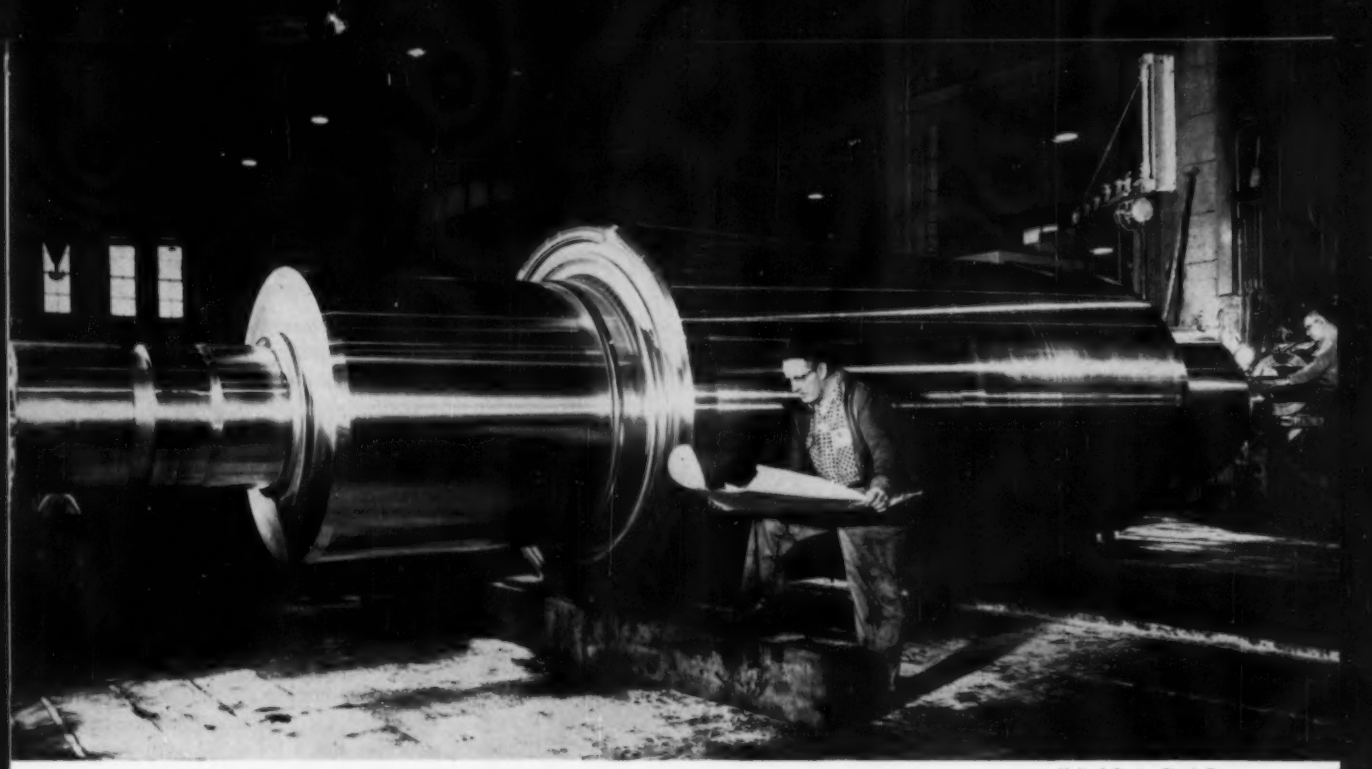
Wise Compromise — Depending upon end use and the production quantities involved, there may be even other factors that will contribute to the final decision of how the part will be made.

Actually, each of the basic fabricating methods mentioned has certain distinct advantages. Depending upon conditions, all may be subject to disadvantages. Some will be major, others minor. So that—to some extent—the decision regarding the most effective fabricating method will involve a compromise in which known advantages will outweigh possible disadvantages.

The decision to forge or to cast a particular part does not in itself constitute a fool-proof formula. It is a decision that cannot be arbitrarily applied to all other parts. Normally, each part will require a separate

Pittsburgh Forgings Co.

ROLL DOWN: Forging rolls are typical of some of the auxiliary equipment that may be used in the production of closed die forgings.



United States Steel Corp.

GIANT: Back-up roll for a steel plate mill is custom forging on the grand scale. Assembly weighs 116 tons.

decision. And there are bound to be cases where a part can be advantageously made in a number of ways at about the same cost.

Weigh Costs—In the case of the rocker arm, for example, we know that there is more than one way to make a satisfactorily performing part. Fabricating costs play a large part in choosing a final method. But even fabricating costs are not the only costs that must be taken into account.

The cost of inspecting the finished part may at times be of critical importance. There have been instances when inspection costs actually exceeded the total of all other costs that went into the making of a finished part.

Final Decision — In the average metalworking plant, the decision to buy steel forgings (as against castings or extrusions, let us say) is not likely to rest with one man. It is more likely to be the result of a team's decision. That team might consist of 1) a purchasing agent, 2) a design engineer, 3) a production specialist, and 4) a metallurgist.

Each of these men is apt to approach his final decision from a different point of view. But when all of these viewpoints are brought together, it is highly probable that every important factor regarding the purchase will have been presented.

Let's systematically analyze some of the key factors that favor the purchase of forgings.

Improved Metal — One leading forging producer emphasizes the fact that metals are actually improved as a result of forging. "The improvement of metals by forging is not just an ideal that governs the function of a business. It is much more than that. It is a statement that expresses the achievement of a result."

Metallurgically, this is a sound argument. All "hot forged" parts involve the mechanical working of metal that has been heated to the plastic state. Forging operations actually knead the metal, providing a high degree of homogeneity or sameness throughout its mass. In the course of "hot working," the metal develops a fibrous structure in the direction of working.

About Flow Lines—This fibrous structure is known as "grain flow." The flow lines that result from forging can be clearly detected when a forged part is sectioned and macroetched. It is generally believed that a proper flow line configuration contributes to the directional properties of forged parts.

So that a major attribute in favor of forged parts is that they incorporate controlled grain flow. This characteristic makes it possible to obtain maximum tensile and torsional strength along with a high resistance to fatigue failure.

Metal Savings—The strengthening of the metal that occurs as a result of forging also makes it possible to safely reduce sectional thicknesses. Strong parts can be designed with relatively thin sections, thus reducing weight and bulkiness.

Metal saved in forging to close tolerances is metal that will not have to be machined to complete the finished part. This can often mean considerable overall savings even when the initial cost of a close tolerance forging is relatively high.

Fewer Defects—Because forging involves the kneading of metal at

United States Steel Corp.

FIRST STEP: Heated to 2400°F, this billet is pierced into a hollow forging. Ultimately, the mammoth cylinder will be drawn to the required length.

high temperatures, steel forgings are almost invariably free of concealed defects such as voids or pinhole porosity. If a forging is made of steel that is acceptably "clean"—steel with a reasonably low inclusion count—it is likely to be sound throughout. For this reason, it is seldom necessary to subject forgings to radiographic inspection.

There are bound to be some exceptions to this general rule. Forgings—in common with other fabricated forms—have been known to fail.

Clean Steels — Occasionally, the problem arises with extra-large forgings weighing several tons. With forgings of this size, metal cleanliness is a particularly critical factor. Nonhomogeneities, usually referred to as "segregation," are also more likely to be a problem with massive forgings. For these reasons, special attention is given the quality of steel ingot intended for large forgings.

The response of steel forgings to a variety of heat treatments is one of their major selling points. Depending upon chemical analysis, they can be annealed, normalized, hardened and tempered, carburized, nitrided, carbonitrided — subjected to virtually every known form of heat treatment.

Fewer Rejects—According to one reliable source: "The response of forged metal to heat treating is more reliably predictable than that of parts made by any other method of fabrication. This reliable response makes the heat treating of forgings a straightforward production process, which insures a higher percentage of acceptable parts with practically no rejects."

With few exceptions, steel forgings can be readily welded by a variety of conventional techniques. Certainly their homogenous metal structure has a lot to do with good welding characteristics. This is important from a design and fabricating standpoint.

Costs Count—Are forgings relatively expensive when compared to other available fabricated forms? This question could only be answered on the basis of the individual forging.

There are many costly forgings produced every year. But the bulk of all steel forgings produced are competitively priced. Bear in mind that many thousands of inexpensive hardware items and low-cost tools are forged. The automotive industry —which has a considerable reputation for cutting manufacturing costs to the bone—is one of the forging industry's largest and steadiest customers.

All Relative—Whether a forging is relatively cheap or expensive cannot always be judged solely in terms of the price of the forging itself. Rather its relative cost should be gaged in terms of the cost of the finished assembly of which it is to be a part. If the use of a forging results in the reduction of overall fabricating costs without sacrifice of quality, it may be a bargain at twice the price of a competitive product.

Only a careful cost analysis can produce a valid answer.

Guide to Forging Methods

Forging is a fabricating principle — not a single process. There are four major forging techniques, each adding to the versatility of forging production.

Which is most likely to suit your needs?

▪ Forging is a versatile fabricating technique. It provides the design engineer with a great deal of latitude in his design as well as size and weight of components and choice of materials.

Because it encompasses various forging processes, it can readily adjust to requirements of cost and quantity. It can be adapted to the needs of either a few custom-built parts or mass produced components running into the millions of units.

Use Four Techniques—Such versatility stems from the fact that forging is not a single process but a fabricating principle that combines four separate forging techniques. These techniques are: (1) smith forging, (2) drop forging, (3) machine (or upset) forging, and (4) press forging.

The desirability of making a forging by any one of these techniques is normally dictated by the part to be forged. Occasionally, however, there may be a choice of ways in which a forging can be made correctly and profitably.

Smith forging take their name from the ancient art of the blacksmith. They are also known as hammered forgings, hand forgings, or flat die forgings. All of this type of forging is hammered between flat dies. Although final forming may require a few simple hand tools, no impression dies are used.

Not Obsolete — Although this technique has a long and venerable history, it is by no means obsolete. It is used today to turn out small quantities of forgings where the cost of production die equipment is not justified. It also comes in handy when regular die equipment is impractical because sections of the forging are too large or irregular.

Modern smith forgings incorporate the fine points of an ancient art that has been brought up-to-date. They are neither crude nor primitive. Although they make heavy demands on the skill and experience of the hammersmith, they can be turned out with remarkable accuracy.

Varied Capacity—According to The Steel Improvement & Forge Co.: "The smith hammer may include the helve and power hammer in sizes from 15 to 500 lb, the steam forging hammer in sizes from 200 to 20,000 lb, and the forging press in sizes from 200 to 15,000 tons. The forging press for smith work is not the type used for impression die forging."

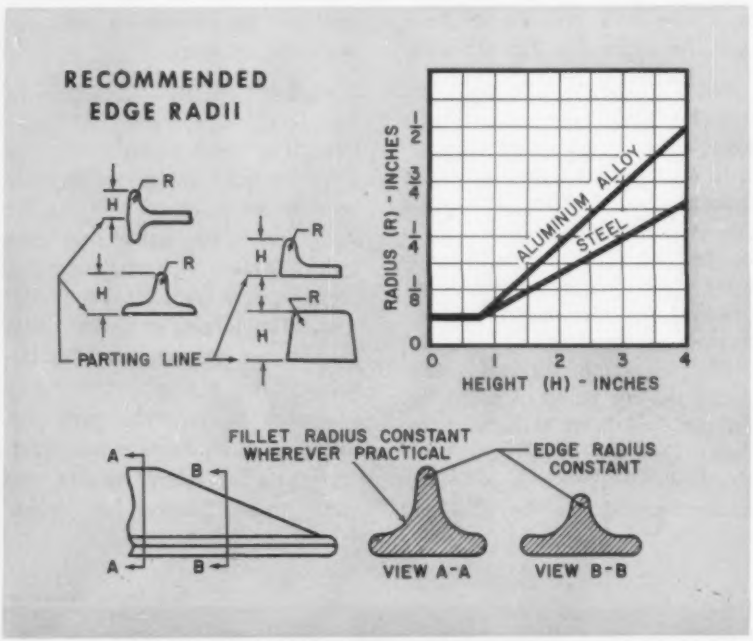
Among the variety of parts produced as smith forgings are: weldless rings of many weights and sizes, stems, flanges, bar, crank-

Drop Forging Association

CLOSED IMPRESSION: These matched dies form parts to close dimensions. During forging, hot metal is confined in all directions.

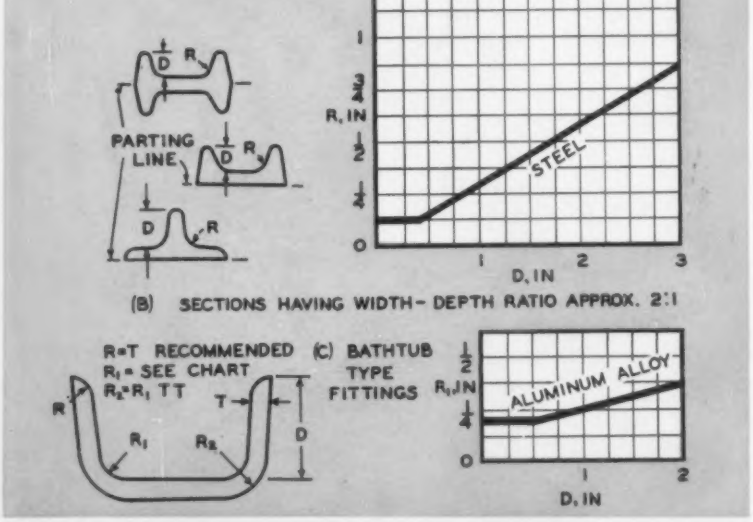
shafts, tappers, and valves. Virtually all types of steels can be smith forged.

Kneads Metal—Drop forging involves "regulated intermittent impact pressure of the drop hammer." It is done with forging dies that contain the shape and contours of the finished forging. Hot, plastic metal is gradually kneaded and pounded until its shape corresponds to that contained in the dies.



WATCH EDGES: Sharp corners on closed impression die radii make it difficult to fill die impression. Follow recommended practice.

Pittsburgh Forgings Co.



FILLETS IMPORTANT: Sharp fillets promote forging defects and increase die wear. Fillet radii above are considered ample.

The drop forging setup consists of a top and bottom die. The top die is secured to the hammer ram. The bottom die is fastened to the anvil cap of the drop hammer. Both dies are carefully aligned to insure accuracy of dimensions of the finished forging. The dies are "closed impression" dies.

Upset And Press — The use of closed impression dies is characteristic of upset and press forging as well as drop forging. It all cases, the plastic metal is kneaded or worked until it fills the die impressions. This technique permits control of the direction of grain flow.

A horizontal type of double acting press is used to produce machine or upset forgings. Instead of the drop hammer action of drop forging, the making of a machine forging involves pushing or squeezing plastic metal into the die cavities. The horizontal press that accomplishes this is commonly referred to as an "upsetter."

Into the Die—In the upsetter, hot forging stock is located between an open pair of gripper dies. These dies are closed, gripping the stock. Then a punch is moved forward to push the plastic metal into the die impression.

Press forging also involves the pushing or squeezing of metal into a die impression. The principal difference: press forgings are made in a vertical-type, rather than a horizontal-type, press.

In terms of the quality of the forging produced, all three types of equipment are quite comparable. The decision to use one type of equipment or another usually rests with the forge shop. It is of only academic interest to the customer whose major interest lies in the end product. Seldom, if ever, does the customer specify the type of equipment with which a forging is to be made.

Steel Quality—Of greater concern to the customer is the quality of the steel used to make his forgings. Depending upon size and other physical factors, forgings are

made from either bar stock or ingot. Where bar stock is used, control of quality is a relatively simple matter. The bar stock is, itself, a finished product and requires only routine inspection to determine its quality.

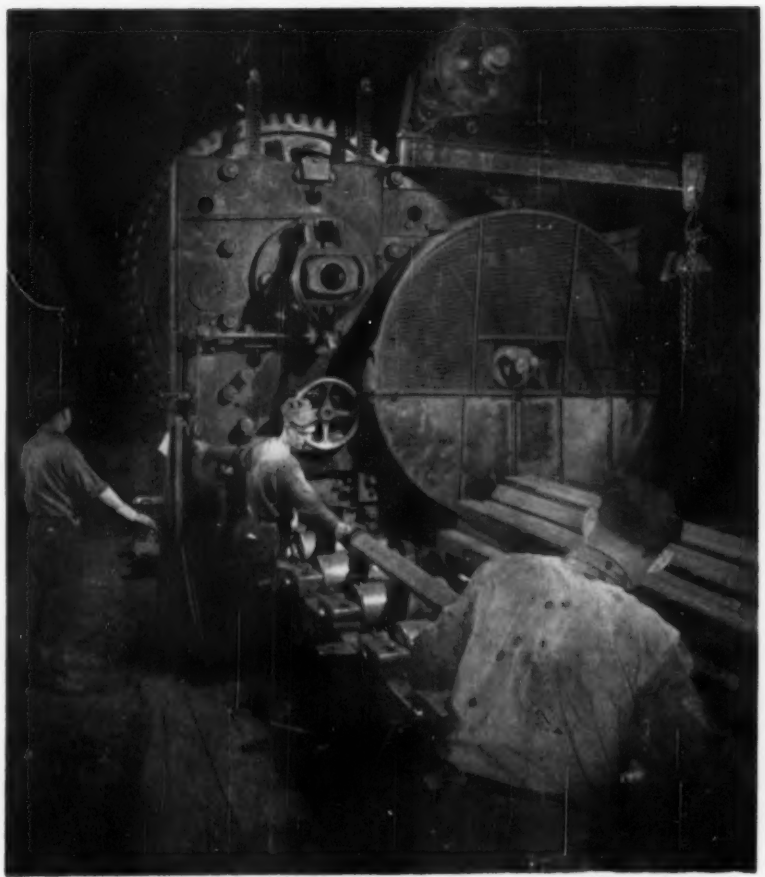
An ingot, however, is a steel casting. As such, it may be subject to such defects as segregation, voids, porosity and inclusions. These conditions cannot always be avoided. According to one forging expert, "they always exist to a degree. They become objectionable only when they exceed a vague boundary which is usually described by the term excessive."

Know Your Ingots — Referring particularly to the making of large forgings, A. O. Schaefer, president of Pencoyd Steel & Forge Corp., notes that "the forging manufacturer must in a very real sense know his ingots, because these are his raw materials."

Some objectionable conditions may "exist in all castings. Forging can accomplish certain improvements to the conditions found in cast metal. So can heat treatment; but heat treatment alone cannot close and weld up voids, refine structure so that it is more easily arranged by subsequent heat treatment, orient dirt so that it will do the least harm, and work segregated metal so that, in some cases, there is even an advantage in having it segregated. Some or all of these things are accomplished in good forging."

Design Pointers—Design is also a highly important factor in the making of a satisfactory forging—especially those made in closed impression dies. By incorporating certain features into the design of a forging, the finished product may actually be improved or produced at lower cost.

Forging draft is one such design requirement. This refers to the slight taper given to the sides of a forging to permit its withdrawal from the finishing die impression. It applies, of course, to those forgings made in closed impression dies.



Pittsburgh Forgings Co.

CUT TO SIZE: Bar stock for forging is cut to definite lengths to assure proper weight. This shear cuts 5-in. square steel bars.

Draft Angles—In normal practice, the standard forging draft angle for outside draft is 7°. For inside draft, it is 10°. Variations in draft may be decreased to as little as 1°. In others, it may have to be increased to as much as 15°. There are even those cases where no draft will be required.

Larger radii and fillets are always recommended for a number of reasons. For one, they provide more room for the change of direction in metal flow. Sharp radii and fillets may contribute to such defects as forging laps, cold shuts, broken fibre structure, and unfilled sections. Also important, more generous radii and fillets result in less die wear and tend to reduce costs.

Avoid Die Wear — What about pockets and recesses? In order to produce these in a forging, there must be corresponding raised sections in the dies at the pockets. Naturally, it is more difficult for metal to flow over raised die projections. If these are designed thin or high, they will heat up rapidly and their temperature is likely to exceed that of the rest of the die.

In the design of ribs, it is advisable to keep rib heights as low as possible. Preferably, the top of the ribs should be full radii. Large draft angles on the ribs sides are also recommended.

Forgings can be made to either commercial or close tolerances. Naturally, close tolerance forging is more expensive and commercial tolerances should be employed wherever possible. In most instances, commercial tolerances come close enough to finish dimensional requirements to save both metal and machining time.

Choice of Steel For Forgings

Most of the plain carbon and low-alloy steels can be readily forged. But costs make it mandatory that you choose your steels with economy in mind.

These pointers on metal costs and quality may help to make your choice easier.

■ While the choice of steel for forging is bound to depend on such factors as required mechanical properties and fabricability, it should also reflect wise buying. From a cost standpoint, the object is to obtain a steel with the best combination of properties for a particular part at the lowest price.

Since alloy costs money, this usually means holding alloy content to a minimum wherever possible. In many cases, plain carbon steels are adequate. In others, it will be necessary to choose from a wide variety of low alloy grades.

Study Stresses — From an engineering standpoint, choice of steel should certainly reflect the types of stress to be met in service. Under most service conditions, stresses encountered will involve varying degrees of tensile, shear, torsion, impact, and fatigue.

Two simple rules will help clarify most stress problems. Where loading is primarily in tensile or shear, through hardening steels are the best bet. Bolts are classic examples of components subjected to these types of stress.

Where fatigue and impact are the primary problem, it is usually advisable to steer clear of through hardening. Laboratory and service tests have shown, for example, that a shallow hardening pattern in highly stressed axles outperforms a through-hardened axle.

Plain Carbon Steels — Several years ago, two forging experts, W. Naujoks and D. C. Fabel, compiled an estimate of available forging steels designed to simplify the problem of selection. Starting with the plain carbon grades, they rated SAE 1020 as an acceptable grade for general forging products. Economical, it has fairly good mechanical properties. It is not a heat treatable steel (other than simple annealing), and it is not recommended where extremely fine machining is required.

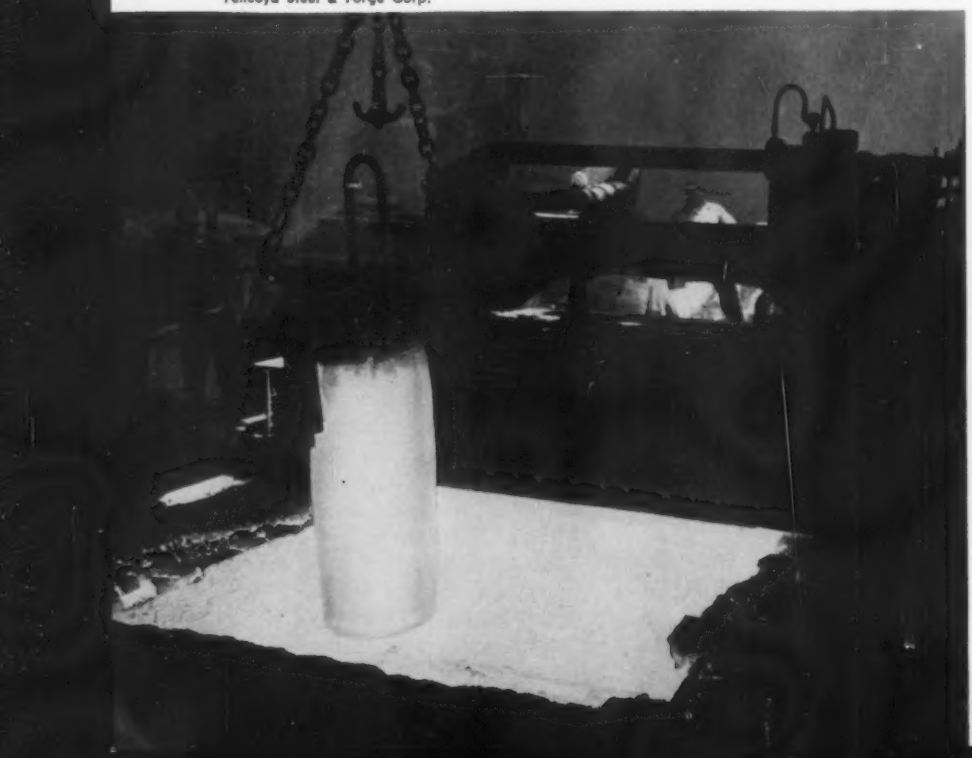
Both 1015 and 1020 can be obtained as carburizing grades. When used as such, it is wise to specify guaranteed carburizing quality. Again, these steels are most economical. But even when carburized, their strength is sufficient only for moderate conditions.

Slightly Stronger — Two other popular plain carbon grades are 1025 and 1030. These can be heat treated to some extent and are slightly stronger than 1020. They also machine better. Neither grade should be used for carburized parts. About the same characteristics also hold true for 1035 and 1040.

For improved hardening characteristics with relatively good machinability in the plain carbon grades, there are 1045 and 1050. These steels have greater strength because of their higher carbon content. Their ductility is only slightly lower.

Carburizing Grades—Among the carburizing grades, there is a wide selection of low alloy steels that possess good forging characteristics. All of these steels have a fairly low carbon content, usually from 0.10 to 0.20 pct. When carburized, they combine high surface hardness with a tough and ductile core material.

Pencoyd Steel & Forge Corp.



CRUCIAL INGOT: Quality of steel is particularly critical in large forgings. Ingots are "soaked" to promote homogenized structure.

Nickel-containing 2315 and 2320 have a good deal of core toughness. Because nickel lowers the quenching temperature required for hardening, these grades are less subject to distortion. With a slightly higher nickel content, 2515 has excellent mechanical properties and is recommended for high quality parts. All of these nickel-containing grades have good machining characteristics.

Add Nickel, Chromium—Particularly useful for gear and worm parts, 3115 and 3120 are economical and provide a tough carburized case. Both heat treating and forging characteristics are good. Containing both nickel and chromium, 3312 and 3315 can withstand high pressure, impact and abrasion when carburized. Their heat treatment require greater care, but they are worth the extra trouble where operating conditions are severe.

Both 4615 and 4620 can be carburized and hardened with a minimum of distortion. They machine well and have high strength. Where even greater core strength is needed, 4815 may be substituted. This grade is fairly similar to 2515 in its mechanical properties.

Less Critical — Because its heat treatment is not critical, 6120 is another very useful carburizing grade. It provides high surface hardness and good core properties. It can be readily forged by all conventional methods.

In the medium carbon ranges, there are many low alloy steels available for forging. In the 2300 series (with carbon contents ranging from 0.25 to 0.45 pct), there are steels that are widely used for high strength machine parts. These are nickel-containing grades that have excellent heat treated properties. At the higher carbon levels (0.40-0.50 pct), these steels are used in the machine tool industry for forged shafts. Again, the nickel content helps reduce warpage of long parts during heat treatment. Fairly similar to these steels are those in the 3100 series.

For Severe Service — The 3200 series are excellent from the forging standpoint and may be used for severe service conditions. They are stronger and tougher than either the 2300 or 3100 grades. They have an advantage in heat treatment in that they harden more uniformly in large sections over 1½ in. diam. These steels are sometimes interchangeable with the 3400 series.

Forgings made of both the 4100 and 4300 series find wide application in the automotive, railroad, aircraft, and farm equipment industries. They offer unusual strength and toughness and can be satisfactorily machined at fairly high hardness levels. The 4100 grades can be water quenched and will retain high mechanical properties even after tempering at elevated temperatures.

Higher Stresses — The 4300 grades contain chromium, nickel, and molybdenum. They are oil hardening and ideal for highly stressed parts. Because of excellent impact resistance, these grades are often used for axle shafts and gearing.

The 6100 steels can be used interchangeably with the 3100 and 4100 series. They, too, have excellent shock resistance and have many desirable properties for mass production machining. Because of their heat treating characteristics, they can be used for forgings that have wide variation in sectional thickness.

Grades For Nitriding — Among other low-alloy grades that are suitable for forging are the Nitralloy steels. In addition to a fairly high chromium content, these steels contain small amounts of aluminum as a special alloy-addition. They were developed primarily for nitriding.

In the nitrided condition, they combine unusually high surface hardness with excellent core toughness. Normally, they are tempered at a temperature above the nitriding temperature prior to nitriding. This assures uniform core properties after nitriding.

This is only a partial list of some of the major low-alloy steels that can be satisfactorily forged. There are actually hundreds of special grades that can be forged.

How Machinable Are SAE Forging Steels?

SAE Grade	Theoretical Per Cent calculated from tensile strength	Approximate Per Cent obtained from data
1010	118	84
1015	108	89
1020	100	100
1025	97	101
1030	93	104
1035	87	93
1040	81	85
1045	78	78
1050	77	76
1095	69	69
1112	100	150
1120	97	130
X1315	93	120
1315	100	85
1335	77	80
1350	69	75
2315	93	98
2320	87	96
2330	83	93
2335	81	89
2345	66	82
2512	77	80
3115	90	93
3120	85	90
3130	80	86
3135	76	80
3140	71	74
3145	66	66
3215	83	84
3230	74	77
3240	66	69
3312	72	76
3335	65	65
3340	62	61
3415	69	77
3435	60	70
4130	79	89
4140	72	83
4150	67	77
4340	58	57
4345	60	62
4615	87	93
4815	87	88
5120	87	86
5140	72	76
5150	68	72
52100	59	58
6120	86	87
6130	77	79
6140	69	71
6150	64	67
6195	61	63
9250	66	69

* Machinability of S.A.E. 1020 = 100.

Caterpillar Tractor Co.

NECESSARY COST: Grinding pin bearings on this forged crankshaft is a machining cost that can't be avoided.

Estimating Forging Costs

If you want to know more about what goes into a forging's selling price, find out about forging costs.

These are the major factors that affect the prices you are likely to pay for forgings.

▪ The estimating of forging costs is of primary interest to the forging producer. In fact, the entire success of his operation depends on it. But by knowing something about how forging costs are estimated, the forging customer gains considerable insight into the nature of the costs that will determine the products' selling price. That's why some knowledge of forging cost appraisal is of general interest.

Actually, job estimating in any field is likely to be intricate. An excellent review of the factors involved in job estimating in the forge shop—intended primarily for forging producers — was prepared by Naujoks and Fabel. But from the customer's standpoint, it is probably more detailed than his limited interest warrants.

Not By the Pound—Forgings are usually priced on a "per piece" basis. They are not sold by the pound, as is customary with castings. Furthermore, forgings cannot be readily classified according to type. Their costs almost always require individual treatment. For this reason, the estimating of forging costs is pretty much comparable to the estimating of machining costs.

Naujoks and Fabel list eight factors that should be included in estimating the cost of production forgings:

1) Net weight, or the weight of the forging finished to the forging drawing dimensions.

2) Gross weight, or the amount of metal required to fabricate the forging.

3) Quantity of forgings required at one setting up of the dies and tooling.

4) The value of the specified metal.

5) The shape of the forging and its effect upon the processing.

6) Metallurgical properties of the metal.

7) Tolerances permitted. (This includes chemical, physical, weight, surface condition, hardness, grain condition, and any other limiting tolerances specified.)

8) Limitation of the shop production equipment.

Weight Important — Just how

does each of these factors affect the cost—and ultimately the selling price—of a steel forging?

The factor of net weight is quite important. Usually, it has to be calculated from a simple sketch or drawing. To do this with reasonable accuracy and in a minimum of time, it is customary to divide the forging into convenient geometric sections. By calculating the volume of each section, a total volume is obtained. This figure, in turn, is multiplied by the weight factor for the material. In the case of steel, this factor is 0.2834 lb per cu in.

Stock Required—But weight calculation of forgings involves still another factor: the determination of gross weight. Gross weight actually describes the amount of metal stock required to make the forging—including wastes. If the forging is simply smith forged to a simple shape, there may be little waste.

This is not generally the case. With drop forgings particularly, there is likely to be metal waste in the forms of flash, tonghold, and scale. In the case of a connecting rod, for example, gross weight is frequently as much as 50 pct more than net weight.

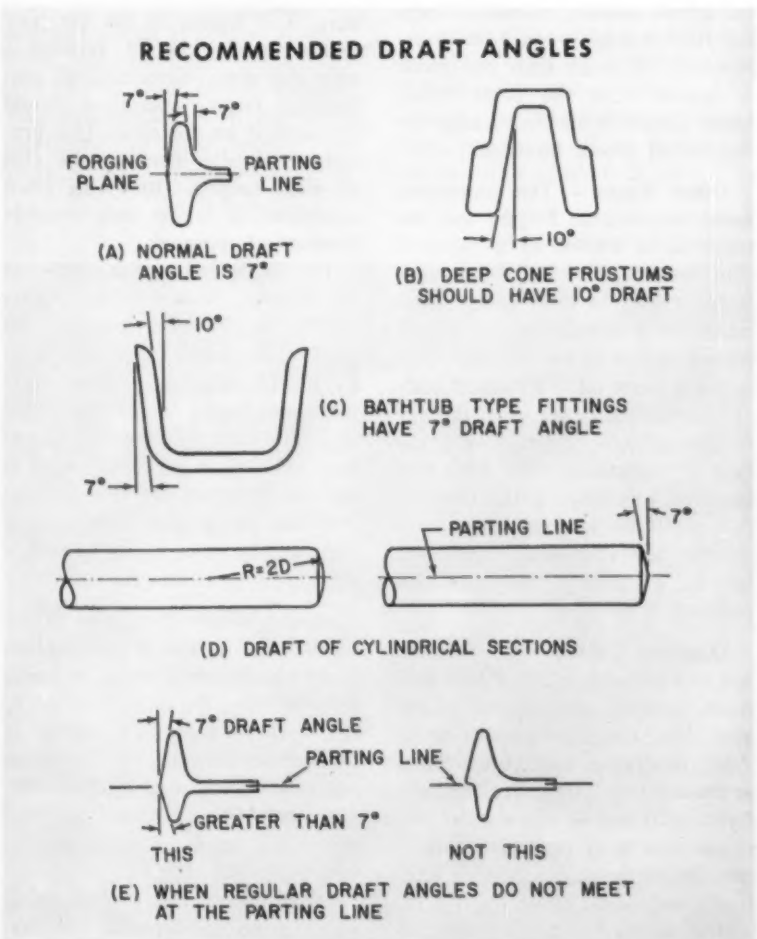
Flash Losses—Loss of metal due to flash will vary according to the weight and shape of the forging. Generally, the amount of metal loss on hot-trimmed flash will exceed that resulting from cold trimming. Two accompanying tables should prove helpful in approximating flash thickness and width on both hot- and cold-trimmed forgings. Where punched holes occur in a forging, the thickness of the slug to be punched out may be estimated as twice the thickness of flash.

Loss of metal due to scaling is another variable. The scaling results from oxidation of the metal during heating and forging. The more reheatings required, the greater the scale loss is likely to be. Still, it can be expected that heavier forgings will suffer a proportionately lower loss of metal due to scaling.

Table 1 | Approximate Flash Thickness and Width for Hot Trimmed Forgings

Net Weight, lb.	Thickness, in.	Width, in.	Weight of flash per in. (lb.)
Up to 1	1/2	3/4	0.0266
1 to 5	1/8	1	0.0354
5 to 10	5/32	1 1/4	0.0553
10 to 15	3/16	1 3/8	0.0730
15 to 25	7/32	1 1/2	0.0941
25 to 50	1/4	1 3/4	0.1250
50 to 100	5/16	2	0.1780
100 to 200	1/8	2 1/2	0.2670

Safe Estimates—For general purposes, it is safe to figure on about 7.5 pct of net weight lost in the form of scale for forgings weighing under 10 lb. From 10 to 25 lb, this factor drops to about 6 pct. For forgings weighing more than



SLIGHT TAPER: Some draft is usually required on sides of a forging for removal from finish die.

Table II | Approximate Flash Thickness and Width on Cold Trimmed Forgings

Net Weight, lb.	Thickness, in.	Width, in.	Weight of flash per in. (lb.)
Up to 1	1/16	3/4	0.0133
1 to 5	1/16	1	0.0177
5 to 10	3/32	1 1/4	0.0333
10 to 15	1/8	1 3/8	0.0487
15 to 25	5/32	1 1/2	0.0668
25 to 50	3/16	1 3/4	0.0937
50 to 100	1/4	2	0.1425

(Forgings over 100 pounds are rarely cold trimmed, and in general, cold trimmed forgings do not often exceed 25 to 35 pounds).

25 lb, 5 pct scale loss is considered a safe estimate.

Tonghold losses usually involve about ½ in. of the bar from which the forging is made. This is the stock required to grip the part during the actual forging operation. If the upend method is used in forging, there will be no tonghold losses. Similarly, if more than one piece is forged from the same billet, losses should be divided among the number of pieces involved.

Other Wastes — The connecting metal between the forging and the tonghold is known as a "sprue." This must also be calculated as a metal waste. In most cases, sprue losses are estimated at 7½ pct of the net weight of the forging.

Shear waste refers to the off ends of bar stock left over when the bar is cut up into pieces of a given length. Sometimes these ends can be used for other jobs. Usually, they must be worked down to a smaller bar size before they are usable. Frequently, they must be counted as scrap.

Quantity Counts—The percentage of waste due to shear loss normally increases as a function of bar size. For rounds or squares up to 2 in., this factor may be estimated at about 3 pct. For larger sizes, the factor increases as follows: 2-3 in.-4 pct; 3-4 in.-5 pct; over 4 in.-6 pct. In all cases, percentages refer to the net weight of the forging.

The quantity of forgings ordered is bound to figure in both costs and selling price. The number of forgings required in a single run is also a factor. Quantities will also play a part in determining the method by which a forging will be made.

Cut Die Costs—For small orders, it is logical to use the least expensive dies or—if possible—only flat dies. Certainly, all preliminary forging operations should be handled on flat dies. This procedure actually increases the cost of each forging. But with small quantities, it is the only possible economical approach.

For larger orders, the conditions are reversed. Now it is cheapest to use the best available tooling. Such tooling frequently pays for itself by helping to reduce labor costs and scrap losses. Since setup time is a fixed cost regardless of quantities involved, it costs no more to set up expensive dies than it does to install cheap ones. Here, again, the quantity order winds up with a distinct cost advantage.

Saving Metal—The value of the metal to be forged is still another factor in the estimating of costs. It is probably the one cost element that can be accurately arrived at without complication. Depending upon the type of steel used, its relative weight in determining total costs may be fairly large or just barely significant.

Where metal costs are low, metal waste is far less critical. In fact, there may be times when it will pay to increase metal waste in the interests of lowering forging costs. A forging might be made slightly heavier, for example, and not quite as close to finish dimensions by the elimination, or the curtailment of, a forging operation.

Even Flash—If this does not result in excessive machining costs, it might significantly reduce the cost of forging. And if the metal is sufficiently cheap, this approach could result in an overall saving—even though it does not reflect optimum efficiency.

Where metal costs are high, such an approach is likely to be prohibitively expensive. So that with the more costly steels, the object of the game is to keep metal waste to a minimum. Even those absolutely unavoidable wastes—such as flash—should be carefully reviewed for possible metal savings.

Keep It Simple—The shape of a forging—simple or intricate—has a direct effect on the number of forging operations necessary to accomplish its completion. This means that the shape of a forging plays a very important role in determining forging costs. With this fact in mind, the design engineer is obliged to simplify his design wherever possible.

But even simplicity in design is not quite enough. It is possible to come up with a fairly simple design that cannot be forged without difficulty. The design of a forging must, to some extent, be integrated with the requirements of the forging process.

Must Be Forgeable—Very thin sections, deep holes, complex and extended projections should be avoided. These will obviously tend to complicate forging operations. But there are other subtle factors that may prove to be just as troublesome. To spot them, the designer must be reasonably familiar with forging practice.

When a simple design is such as to interfere with the easy flow of plastic metal, it is no longer simple

from the forging standpoint. Because it tends to hinder metal flow, it might cause such forging defects as laps, cold shuts, broken fibres, or crushed metal. Anyone of these defects may be serious enough to require that the forging be scrapped.

Good Flow — So to avoid scrapped forgings, limited production, and high costs—keep forging design as simple as possible. Above all, make sure that the design is forgeable. In practice, neither of these requirements is especially severe. Complex designs are being produced by forge shops all the time. The significant point to remember is that complexity in design must not be such as to render a forging unforgeable.

Metallurgical factors also contribute to forging costs and production. Some metals—such as low carbon steel—flow easily in the plastic condition. Higher carbon steels and stainless are more resistant to plastic deformation.

Role of Temperature — Forging temperature is another metallurgical factor that may either make forging easier or more difficult. The higher the forging temperature, the greater is the plasticity of metal. But the allowable forging temperature is prescribed by metallurgical quality. Too high a temperature will actually harm the metal.

One reason that low carbon steels are easily forged is that their forging temperature may go as high as 2450°F without damaging the metal. With many other steels maximum allowable forging temperature is not likely to exceed 2100°F.

Though plastic, some steels abrade the forging dies more than others. This is another factor that may contribute to increased costs.

No Sacrifice — In general, the metallurgical factors that affect forging costs must be taken for granted. Certainly, it would be unwise to choose a steel solely on the basis of its forgeability. This would be sacrificing the product in favor of the process.

Metallurgical tolerances or specifications cover chemical analysis, surface condition, hardness range, mechanical properties (such as tensile strength and ductility,) grain size and structure, and weight requirements. Holding a particularly close or special chemical composition involves an extra charge. To keep costs down, such requirements should be specified only when entirely justified either by the function of the part or the nature of its fabrication.

Surface Conditions—Surface condition of a forging is particularly important when no further finishing is to be done on one or more of its surfaces. This may be only a matter of appearances or it may be based on certain engineering requirements such as fatigue strength. Nicks, pits, and other surface defects tend to lower fatigue strength.

Surface condition can also be of importance in heat treating the rough forging. Surface seams or dents will frequently nucleate quench cracks—thus destroying the forging.

From a cost standpoint, a good surface finish is an asset in many respects. It will help to reduce machining and finishing costs. It may contribute to product appearance and thus enhance sales. But these are advantages that must be bought at a price. Stringent surface requirements are costly. They may entail special handling, extra inspection, special forging dies or equipment, and even special forging quality steel.

Hardness vs Costs—Specifying a particular hardness range may also greatly increase inspection costs. In extreme, it might require a 100 pct hardness check of all forgings. Also, it will require closer control in heat treating. This is sometimes justified either because of the inherent quality required or because of savings realized in subsequent machining.

Certain minimum mechanical properties are often specified where critical parts are involved. This usually means careful control of heat treating in all its stages and test sampling actual forgings.

Steel Improvement & Forge Co.

FOR QUALITY: Sonic testing of forging billets usually suffices to check soundness of forging stock.

Pointers For Purchasing Agents

When you buy forgings, there are a number of ways to cut machining costs. Such operations as straightening, coining, planishing, and ironing—all can be furnished by the forgings producer.

Here are check points for purchasing agents interested in lopping shop costs.

▪ Several years ago, The National Association of Purchasing Agents and the Drop Forging Association pooled their talents and experience to prepare a guide for buying forgings. Designed primarily for purchasing agents, it answers many of the questions the customer is likely to raise in connection with the purchase of forgings.

Although the guide applies particularly to closed die forgings, many of the pointers provided apply equally well to all types of forgings.

Material Advantage—The questions of procurement and delivery, for example, are always of major concern to purchasing agents. These are factors that directly influence his ability to meet inventory and production schedules.

A particular advantage of forgings is that they can be made in a wide range of plain carbon and low-alloy steels. These are standard materials and can be easily obtained. In many instances, the forging will be made from ordinary bar stock. This helps to eliminate a major problem in procurement and makes it easier to guarantee a steady flow of parts on schedule.

Cuts Machining Costs—As for closed die forging, this technique makes it possible to forge accurate shapes to very close tolerances. As a result, a number of machining and finishing operations can be either eliminated or sharply curtailed. Many forgings require nothing more than a simple punching or threading operation. This helps to cut costs and side-steps many potential production problems.

Thanks to hot-working, forged steel is homogenous and uniform. This goes far toward guaranteeing necessary mechanical properties. But it also helps in machining and welding operations. It makes productive capacity more predictable by cutting down on shop problems.

Better Heat Treating — Metal uniformity also helps to guarantee consistent results in heat treating—another potential production bottleneck. Response to hardening, tempering, carburizing, and nitriding can be depended upon even on the basis of a relatively few sample parts. Rejects in heat treating are cut to a minimum.

Along with procurement and delivery problems, the purchasing agent is also vitally interested in maintaining material quality standards. It is partly his responsibility to see to it that all specified requirements are met. This holds true regardless of price considerations or the vendor with whom the order is placed.

Inspection Cheaper — Choice of a wide range of forgeable materials is a definite advantage in maintaining quality standards. Quality is further improved by hot working and holding forgings to close dimensional tolerances. The likelihood of finding voids or other flaws in forgings during machining is very small.

This means that sampling inspection methods can be depended upon. Radiographic inspection is virtually never required — thus

Alco Products, Inc.

SAVES TIME: Using leaded steel forgings greatly speeded up this straddle-mill dovetailing operation.

Table I | Properties of Standard vs Leaded Forging Steels

Normalized & Tempered

AISI Grade	BHN Ave.	U.T.S. psi	Yield Str., psi	Pct El.	Pct R/A	Section Size (Inches)
10L29	146	77,000	51,500	28.5	61.2	5⅜ x 5⅜
1029	146	76,250	49,950	31.5	62.4	5⅜ x 5⅜
10L40	156	82,500	51,500	27.5	46.4	10 dia. rd.
1040	156	82,500	47,500	24.0	40.4	10 dia. rd.
1040	149	82,500	49,000	28.5	49.3	10 dia. rd.
10L45	170	90,000	52,500	23.0	45.0	9⅛ dia. rd.
1045	175	91,300	47,500	25.0	38.9	10 dia. rd.
10L45	163	95,300	51,300	27.0	46.4	9⅛ dia. rd.
1045	163	85,500	47,500	29.0	50.7	10½ dia. rd.
1050	168	88,750	50,750	32.0	49.3	10¼ dia. rd.
10L50	170	90,000	47,250	29.0	48.5	10¼ dia. rd.

Quenched & Tempered

10L45	210	109,080	68,250	20.6	39.8	11 1/16 x 12¼
1045	216	109,250	63,800	17.8	35.9	3¼ x 20¼
10L45	208	106,060	62,870	20.2	41.8	3¼ x 20¼
10L45	235	113,750	71,980	22.8	44.5	2 5/16 x 10¼
10L45	242	122,370	85,000	22.0	45.7	4⅝ x 11¼
10L50	232	117,250	73,250	22.2	43.5	3 1/16 x 12¼
10L50	234	117,000	72,250	20.8	43.1	3 1/16 x 12¼
10L50	248	126,650	83,500	22.0	42.0	4 x 9⅛
10L60	260	137,290	79,480	17.3	33.4	8 3/16 x 13¾
1060	217	114,000	62,500	16.0	24.1	13 dia. rd.
10L70	279	144,850	86,870	15.7	37.0	2 3/16 x 11¼
1070	285	144,500	101,000	19.0	35.8	2¾ x 5 11/16
10L70	311	157,170	103,750	13.8	26.2	4 x 8⅜
1070	302	157,000	112,000	15.0	32.5	2¾ x 5 11/16
41L30	254	123,370	102,700	17.5	48.1	2½ x 4½
41L37	250	122,000	100,000	23.5	61.8	1½ x 1½
41L40	242	118,000	91,250	20.3	56.8	6⅜ x 15⅛
4140	255	120,000	91,000	20.5	50.7	4⅝ x 7
41L40	266	133,000	107,250	17.3	46.4	3 3/16 x 14
4140	269	130,500	100,500	20.0	46.8	2¾ x 7⅞
41L40	273	130,440	111,750	14.9	41.1	6⅝ x 4
4140	260	126,770	104,170	18.8	49.6	3⅞ x 5
41L40	321	150,680	128,750	16.3	45.7	1¼ x 3¼
41L40	328	157,000	134,540	14.4	40.4	6⅝ x 4
41L50	248	126,250	85,380	20.0	48.8	2¾ x 7 9/16
4150	235	119,750	86,600	19.5	48.0	4⅜ x 6⅞
41L50	255	118,500	86,500	17.0	48.0	3⅝ x 4½
4150	262	124,000	92,500	19.0	49.3	4½ x 10⅛
41L50	262	121,500	93,000	19.5	51.8	2⅛ x 3 3/16
41L50	285	133,500	105,000	15.5	45.0	2⅜ x 3⅜
4150	275	131,999	97,500	16.5	46.4	3¼ x 4¼
43L40	281	133,250	106,250	17.5	51.9	4¼ x 9¾
4340	277	129,000	109,000	17.0	50.7	12⅜ dia. rd.
43L40	311	146,750	124,000	16.5	47.9	4¾ x 8
4340	285	136,500	116,000	16.5	42.0	5¼ x 5½

Courtesy: Alco Products, Inc.

Table II | Facts on Forging Die Wear

Metal	Prod. Ratio	D. L. Ratio	Metal	Prod. Ratio	D. L. Ratio
S.A.E. 1010	100	105	S.A.E. 5120	97	90
1020	100	100	5130	93	87
1030	98	98	5140	89	84
1040	96	95	5150	86	80
1050	93	90	6120	96	88
1060	90	85	6130	92	85
2320	97	90	6140	88	81
2330	93	87	6150	84	78
2340	89	84	Forging Copper	125	110
2350	85	80	Forging Brass	107	115
3120	98	92	Naval Brass	103	110
3130	95	88	Silicon Bronze	87	83
3140	90	85	Manganese Bronze	88	85
3150	87	82	Monel Metal	30–60	20–60
3220	94	86	Nickel	30–60	20–60
3230	90	84	Stainless-Type 302	80	20–65
3240	87	81			
3250	84	77	325	76	20–65
4120	98	90	410	85	30–70
4130	95	87	416	85	30–70
			420	70	20–50
4140	90	84			
4150	87	80	Ingot Iron	100	100
4340	70	65			
4815	90	84			

(Note): Design of the part, heating facilities, forging technique, and condition of production equipment all have an important bearing on production ratio and die life ratio. Ratio figures must, of course, be very general.

eliminating one of the most expensive inspection procedures.

A choice of welding methods also makes it easier to maintain quality standards. It isn't necessary to choose a welding method strictly on the basis of the material to be welded. The advantages of the particular welding method can be permitted to contribute to product quality. Steel forgings can be welded by most conventional processes including resistance, thermit or thermit pressure, gas, and arc.

Other Advantages — Many of these attributes help the purchasing agent and production executive in their efforts to maintain production schedules and reduce material losses during processing. To some extent, they may also contribute to the reduction of failed parts in service.

But from the standpoints of both purchasing and production, there are still other advantages in forgings that should be considered.

Of considerable importance are the finishing operations applied to most forgings before they are shipped to the customer. These can (and frequently do) save an appreciable amount of machining and finishing time at the customer's plant.

Trimming Helps—Drop forgings are almost always trimmed at the forge shop. By trimming is meant that all flash metal or finish is removed from the completed forging. In some cases, upset forgings also require trimming before shipment. Other finishing operations frequently handled at the forging source include punching, forming, straightening, planishing, grinding, heat treating, cleaning, ironing, sizing, coning, and restriking.

Each of these operations can represent a potential saving in shop time at the purchaser's plant. Punching, for example, can eliminate one or more preliminary drilling operations.

Punching Holes—It is a simple and direct method for piercing holes in forgings where they are needed. The punched hole can be held to rather close tolerances and requires a minimum of machine finishing.

Broaching is another function that is often handled at the forge shop. Again, the object is to provide a hole or slot in the forging or to remove excess draft.

Many forgings are bent to meet a desired contour. Forged hooks, for example, can be either forged to shape in forging dies or bent into the familiar half-round from flat stock. Where intricate contours are required, the bending of hot metal can eliminate or simplify many involved machining operations. What's more, bending can sometimes be accomplished in inexpensive, cast iron dies.

Another Variation—Twisting is a variation of bending. It is generally applied to forgings that can be more economically forged in a certain position. A simple twisting operation is then used to bring the forging into the shape desired.

Sizing is another press operation designed to bring small surfaces to within closer tolerance. It can also be used to straighten, lengthen slightly, or bring parts into better alignment. In all cases, it eliminates the need for one or more extra machining operations.

Smoother Finish — Ironing is used to produce a smooth surface on forgings. By this means it is possible to obtain a surface that is equal in smoothness to a machined surface. A typical example of ironing is to be found in forged gasket rings. Here the ironed finish is smooth enough to seat between flanges with ground gasket seats.

Acknowledgment: The editors want to thank the Drop Forging Association, the many forgings producers, and forging equipment manufacturers whose ideas and practical suggestions helped make this feature possible. Also, they want to acknowledge the assistance of Republic Steel Corp. and reference data provided by the American Society of Metals.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

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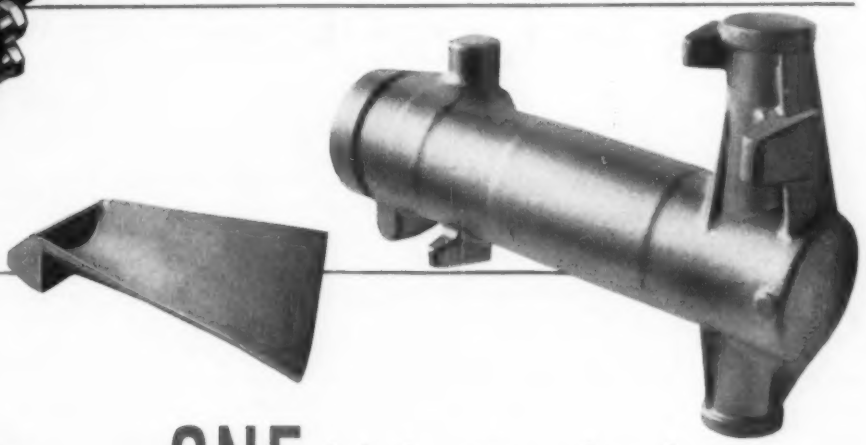

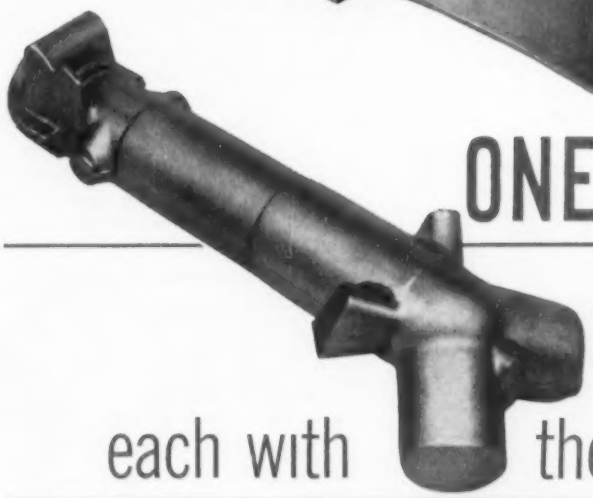

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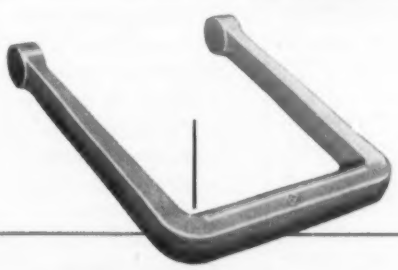

of forged quality

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Over the years, the many thousands of forged parts made by Kropp have had one thing in common . . . *high quality*. Our reputation for producing the best in forgings has been earned through years of research and specialized engineering, by skilled and experienced manpower operating modern equipment. Kropp Forge is an important supplier of parts to leading American industries . . . high quality forgings that have been depended upon to fulfill their purpose. Your requirements for forgings . . . drop, flat die or press . . . rough or machined . . . in steel, titanium or special alloys, will be met at Kropp. Our complete forging service is at your disposal.

Picking Right Fluid Saves in Long Run

In choosing hydraulic fluid, questions pop up like: What's initial cost? Effectiveness? Useful Lifetime?

Don't forget: How well does it resist fire?

▪ Users of hydraulic fluids in hot areas want the best protection at least cost. They ask for fluids that work well, last long as possible and cost the least.

Cost isn't easy to figure. There's nothing cheap about an "inexpensive" material that accidentally bursts into flames. On the other hand, why pay for protection you don't need? Users carefully weigh initial cost against recommended operating temperature, never forgetting other important requirements.

Out To Pick One — One firm that's found a good fluid for its own use is Phelps Dodge Copper Products Corp. At its Elizabeth, N. J., plant, the company heats copper bars to 1700°F. In moving bars to wire rolling mills, hydraulic handling units play an important part.

Before this hydraulic system was filled with the present fire-resistant fluid, safety men envisioned the remote possibility of an accident where high-pressure oil would spray into the 2000°F furnace. Remote though it was, Phelps management determined to find a fluid that would prevent it.

Start Looking—The first fire resistant fluid tried failed. It resulted in sporadic movement of charging and discharging mechanisms. So engineers loosened packing glands and increased operating pressure to overcome this. The increase in pressure generated so much heat the fluid's recommended operating temperature was soon exceeded. The material was abandoned the first day tried.

Purging the system, they put back the old petroleum oil. Intermittent poor operation continued due to sticking valves, gummy deposits, corrosion and numerous leaks. Once again, the system was cleaned. A new petroleum product filled it. This worked fine. Of course, it didn't give any fire protection.

Engineer checks controls of the hydraulic handling system.

At Wits End—About a year ago, the firm tried Irus Fluid 902. This

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 121. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

How to measure

Now is the time to take a long, hard look

A continuous furnace is more than just a brick-lined structure built to heat a material; it is a processing tool.

Like all processing tools, it must be evaluated on an overall basis. Fuel consumption and efficiency may be completely outweighed by many more-important economic factors centering around your workpiece, your total production program, and your work force.

Your evaluation may well prove that an investment now in Selas continuous heat processing will bring immediate returns in reduced costs and improved product quality.

To help you take this long, hard look at your heat processing equipment or requirements, Selas offers these 15 evaluation factors:

- **Material saving**
- **Labor requirements**
- **Automatic operation**
- **Material handling**
- **Maintenance**
- **Human element**
- **Product quality**
- **Temperature control**
- **Work in process**
- **Product value**
- **Fuel efficiency**
- **Production requirements**
- **Flexibility**
- **Process coordination**
- **Floor space**

The factual report on the facing page tells how a manufacturer of business machines took this long, hard look at one phase of its electric typewriter production. Every evaluation factor proved significant: two factors combined to represent savings which equalled the cost of the Selas custom-built equipment in less than one year!

SELAS

the real cost of continuous heat processing

. . . here's how one SELAS heat treating installation stands up under that "long, hard look!"

For dependable performance, electric typewriters require hard, tough, perfectly flat type-bars. By a previous method, hardness and toughness were imparted to the steel stampings but the flatness left something to be desired.

This Selas heat processing machine produces hardness, toughness and flatness never before actually achieved!

Former equipment included two open salt baths, hazardous even in day-to-day operation; particularly dangerous during the monthly clean-out of carry-over sludge.

The Selas equipment uses a single covered salt bath which has completely removed both of these hazards.

Material Saving

Selas direct heating eliminates the high temperature salt bath thus preventing contamination of the salt quench. Salt savings have been estimated by Selas engineers to amount to $25,000 per year.

Labor Requirements

Three men do the work previously performed by five . . . a labor saving of 40%. In a continuous 2-shift operation, annual savings can amount to as much as 26% of the original equipment cost. These savings might very well be doubled by fully-automatic loading now being developed.

Automatic Operation

Type-bars are conveyed automatically through the high temperature Gradiation® furnace, the salt quench, the washer and the dryer.

Material Handling

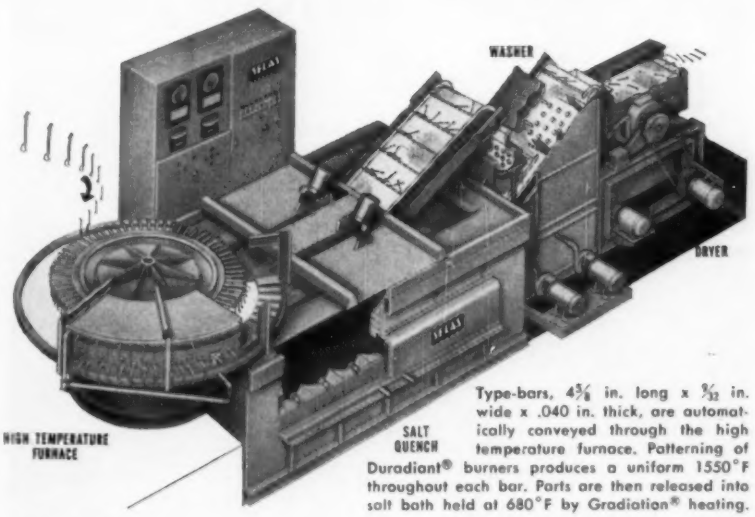
The compactness and simplicity of the Selas unit have eliminated the need for dip-type fixtures. Instead of being transported through the plant to a separate heat treating department, parts are loaded from the adjacent stamping press to pass automatically through the several processes embodied in this one Selas machine —and are delivered for final tumbling and plating at the discharge end of the unit.

Maintenance

Because racks and extra fixtures are not required and salt pot cleaning is reduced to a safe, routine operation, maintenance costs are substantially less.

Human Element

Custom-built precision and automatic operation avoid variations due to human handling. Top production of uniformly austempered type-bars is consistently achieved.



Type-bars, 4⅜ in. long x 9/32 in. wide x .040 in. thick, are automatically conveyed through the high temperature furnace. Patterning of Duradiant® burners produces a uniform 1550°F throughout each bar. Parts are then released into salt bath held at 680°F by Gradiation® heating.

Product Quality

Type-bars austempered in this machine meet specification for flatness of 0.001 in. and for hardness of Rc 42-44.

Temperature Control

Furnace temperature, salt quench temperature and dryer temperature are automatically controlled from the convenient cubicle supplied by Selas.

Work in Process

Previous batch method consumed hours. This Selas continuous heat processing equipment heats conveyorized type-bars in 25 seconds, holds them in the salt bath for 15 minutes, cleans and dries them . . . a total of 21 minutes for the entire, complex austempering process.

Product Value

Value of the product as it is passing through this machine in a few hundred hours equals the customer's entire investment in the Selas custom-built equipment.

Fuel Efficiency

Fuel cost amounts to about 1 hour of the 320 hour monthly production.

Production Requirements

The Selas machine is capable of uniformly austempering 5,000 type-bars per hour.

Flexibility

Any of a number of similar metal stampings can be processed in this versatile machine. The customer has since purchased a second Selas machine to austemper cam levers at production runs of 6,000 per hour, as well as type-bars.

Process Coordination

The Selas machine, developed cooperatively by the customer's and Selas' engineers, was designed to fit into the production area, completely integrated with the normal production schedule of the electric typewriter manufacturer. All equipment, including panel-mounted combustion and temperature controls, was built at Selas. Selas engineers supervised start-up in customer's plant.

Floor Space

The compact unit occupies about half the floor space occupied by previous equipment. With all the heat directed into the workpieces—not the work area —adjacent floor space can be utilized efficiently.

* * *

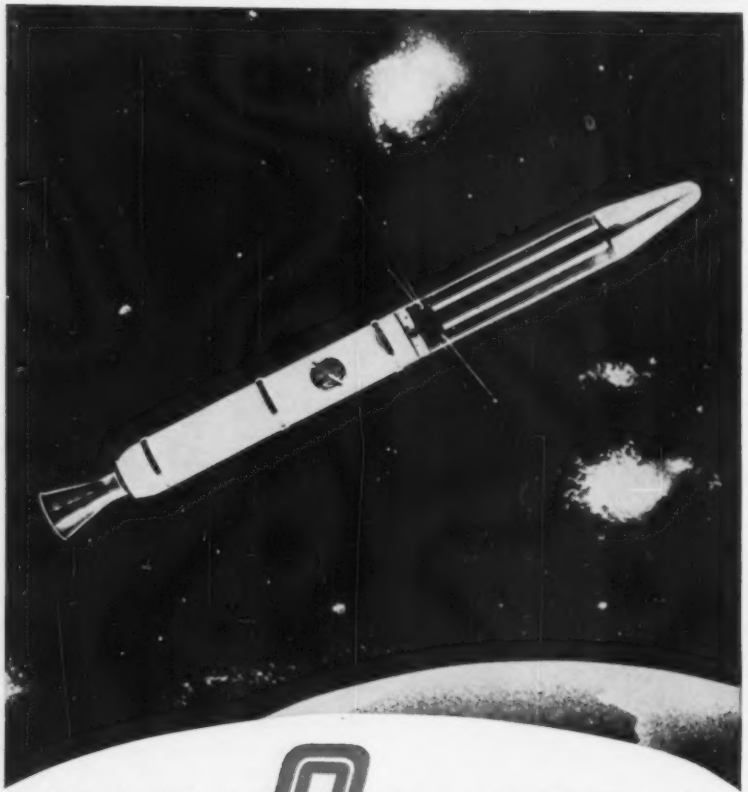
For further information on this installation, send for reprint "Automatic and in the Line." For case histories covering other heat treating operations, heating for hot working, and brazing, send for reprint "An Economic Appraisal of Continuous Heat Processing." Address Dept. 18, Selas Corporation of America, Dresher, Pa.

Gradiation and Duradiant are registered trade names of Selas Corporation of America.

SELAS
CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers
DEVELOPMENT • DESIGN • CONSTRUCTION

When there's *no second chance* to correct weld metal performance



WELD WITH ARCOS

STAINLESS BARE WIRE

Even the critical countdown can't pre-test every vital factor before launching an earth satellite. Weld metal performance at diverse temperatures, various pressures and speeds can be known only through operation. Explorer I—America's first earth satellite—and Explorer III—designed and built at California Institute of Technology's Jet Propulsion Laboratory—both carry welds made with Arcos materials. Arcos CHROMENAR 12 (Type 410 stainless bare wire) was selected for welding certain components. Here's proof again why Arcos Welding Rods and Bare Electrodes are used so widely when results and performance must be predetermined as accurately as possible. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

Shell Oil Co. product is a water-based emulsion type fluid. It combines water, petroleum oils, and special emulsifying agents.

In the time the Shell fluid has been in use, it has shown excellent fire resistance, lubricating properties, hydraulic efficiency, equipment compatability and economy.

The latter advantage is not to be taken lightly. A cheap fluid in the beginning isn't necessarily the cheapest in the end. Nor is vice versa an absolute truth. Each hydraulic fluid must be judged on its own merits in relation to each individual installation. Fact is, however, that Shell's fluid costs up to ⅓ less than other fire resistant fluids tried by the company.

Forming

Carbide dies reduce firm's scrap loss

Thanks to cemented carbide, a company drawing 7-in. oil well casings has a smaller scrap pile. Rejects not only are down, but quality of tubing is up. For these,

Carbide die gets final check before going back to work.

and other, reasons the firm is now using carbide dies exclusively.

In use at Pittsburgh Steel Co.'s Allenport Works, the dies permit fast drawing and give long life. Company records show a typical carbide die averages 400,000 ft of drawn casing before being with-

drawn from service. It figures this is about 320 ft per dollar spent on the die.

Scrap Pile Down — Reason for reduced rejects is this: Smooth carbide surface just doesn't produce them. What's more, since the dies went into use in 1947 there have been no carbide die failures. Thus, no rejects due to such failures.

Dies with nibs of Carboloy cemented carbide grade 55B arrive from General Electric Co.'s Metallurgical Products Department, Detroit, rough drilled to 6.990 in. Die finishing removes about 0.025 in. Drawing begins with a 7.015-in. diam die. The die stays in use until diameter increases to 7.035 in.

Dies return to Pittsburgh's mandrel and die shop every 16 hours for servicing. By this time they have produced 200 32-ft lengths of oil well casing. The dies are serviced regularly, not of necessity, but as a matter of insurance to maintain uniform quality and prolong die life. With two dies always ready, one is on the bench and one is on standby.

Plastics

Molded of Fiberglas-reinforced Hetron 32A polyester resin, a new fishing-boat bridge is lightweight, yet sturdy. Complete with instruments, steering wheel and controls, it weighs but 100 lb against 240 for the usual type. "This represents the beginning of a continuing program to use more and more molded fiberglas-reinforced fire-resistant Hetron for other components," says Hooker Chemical Corp., Tonawanda, N. Y.

Welding

Kraft paper use cuts welding cost

Ingenious use of 50-lb kraft paper, the same as retail stores wrap packages with, now makes possible field use of inert gas welding methods. Inert gas welding in the field has been limited by difficulty in retaining gas in the weld area and

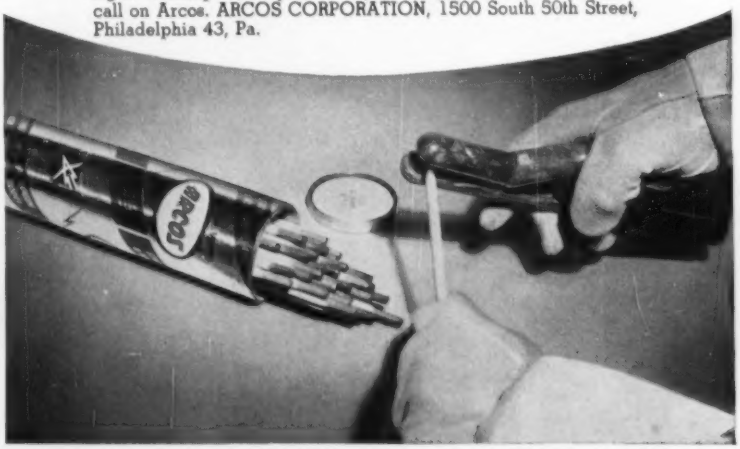
When low alloy weld requirements are as *critical* as these

Job report courtesy of McKiernan-Terry Corp., Dover, N. J.

WELD WITH ARCOS

LOW HYDROGEN ELECTRODES

This crosshead weldment—part of a Navy steam catapult for launching jet fighters—must withstand the repeated powerful surges of steam under high pressure. Arcos Tensilend 80 electrodes were used to weld the SAE 4130 low alloy steel. After progressive magnaflux checking, and proper stress relieving, all welds were found to meet the high strength and toughness required for this kind of service. For the *right* weld metal—for the *right* welding techniques—for your tough welding problems—call on Arcos. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.



LACLEDE'S NEW HIGH-SPEED
CONTINUOUS WELD
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PRODUCES QUALITY PIPE
FOR ALL YOUR NEEDS

Continuous weld pipe, in sizes ½ inch through 4 inch and in lengths up to 60 feet, is now available from Laclede's new high-speed continuous weld tube mill.

Made with uniform physical characteristics, pipe from Laclede's new mill is quality controlled . . . every step of the way . . . assuring quality tubing at its best.

LACLEDE STEEL COMPANY

Producers of Quality Steel
for Construction and Industry
SAINT LOUIS 1, MISSOURI

then getting rid of the retaining device.

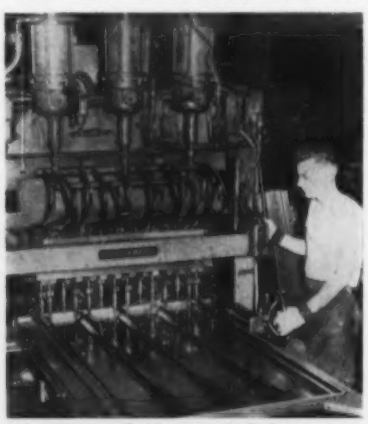
By hitting on the use of a circular piece of kraft paper attached with masking tape as a baffle six inches from the ends of the pipe to be joined, Robert T. Pursell, metallurgical engineer with Stone & Webster Engineering Corp., solved the problem. The paper withstands pressure of 3 or 4 oz an inch exerted by the inert gas and the welding heat of up to 600°F. But at the end of the welding process, during the annealing or stress-relieving phase, both paper and the masking tape disintegrates, leaving the pipe clean.

Fabricating

Cold rolled steel use aids fabricators

Use of cold rolled sheet reduces costs and simplifies every fabricating operation in the production of steel office furniture, one manufacturer finds. As a result the firm no longer uses hot rolled steel for any part. Even heavy gage reinforcing members which don't require a fine finish or appearance are being fabricated of cold rolled steel.

"Cold rolled steel cuts better, forms and draws better, welds better, and finishes better than the hot rolled steel we formerly used



Welding of the metal is never hampered by rust films.

for many components of our furniture," according to Corry-Jamestown Mfg. Corp., Corry, Pa. Furthermore fine flat surfaces attainable with CRS improve the appearance of the company's desks and files.

Metals Men Agree—There are good reasons for such advantages, point out metallurgists of Jones & Laughlin Steel Corp., Pittsburgh. Principal factors contributing to easy fabrication are: fine grain

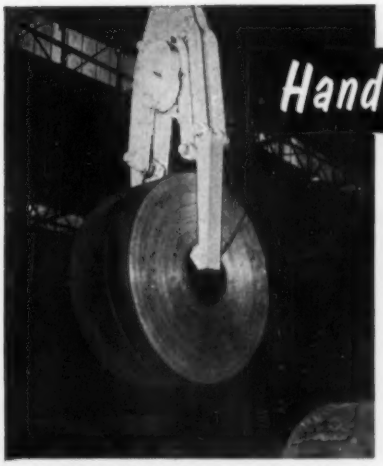
Press forms round corners with no splits or notching.

structure, ductility, and hardness. Lower pressure necessary for cutting this steel gives long life to cutting tools and blanking dies.

Uniform grain structure and ductility also provide good forming and drawing characteristics. An example of this is the round corners formed on desks' end panels. These corners, with a radius of 13/16 in. in one direction and 1⅜ in. in the other, are being made from commercial grade CRS without splits or notching.

Saves On Enamel—Because of CRS' fine surface, the company finishes furniture with a single coat of synthetic baking enamel. Two coats were once required on other fabricating materials. Only preliminary surface preparations now are washing and phosphatizing.

Thickness uniformity and favorable mechanical properties of light-gage CRS are also important factors to designers of office furniture.



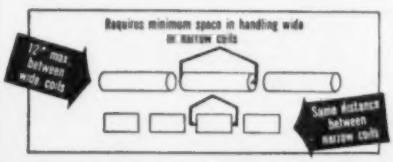
Handling Coil Stock?

CHECK THESE

C-F LIFTER ADVANTAGES

- 1 Lifter handles wide range of coil sizes
- Requires minimum of only 10" to 12" between piles —saves storage room
- 1 man operation — eliminates hookers
- Positive grip on coil — no damage to material

• C-F Coil Lifters are saving time and labor in many plants and warehouses because they can pick up, carry and set down a coil of steel faster and safer than any other method. Infinite jaw openings permit handling a very wide range of coil widths . . . carrying legs open fast, stay open until operator closes them on coil. Narrow legs require minimum space between piles – a space saving advantage. Made in motorized models for crane cab or pendant operation as well as manual types with chain wheel, in capacities from 3 tons up. Powered Rotating Heads available. Opening ranges to suit your requirements. Write for illustrated Bulletin.



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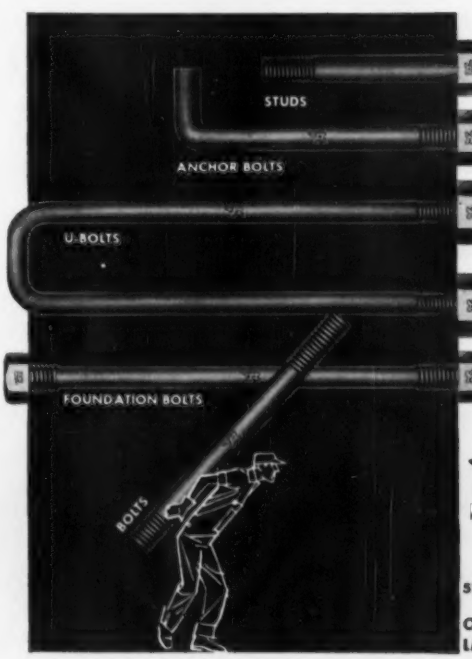

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HEVI-DUTY ANNOUNCES
the addition of fuel-fired furnaces to its line

Clean-Line Automatic Heat Treating Unit handles heat, quench and draw cycles — all within protective atmosphere. Ideal for automatic bright hardening, carbonitriding, carburizing and other operations requiring temperatures to 1850°F. Washer, atmosphere tempering unit and atmosphere generator are available for a complete system.

Melting Furnaces — rigid or tilting types, manual or power-operated. Included are *crucible furnaces* and *dry hearth furnaces* for melting aluminum and other soft metals.

Forging Furnaces include adjustable slot forges and rod end forges with operating temperatures to 2200°F.

Hevi-Duty has added to its well-established line of electric heat treating furnaces, a complete range of quality *fuel-fired* furnaces for heat treating, melting and forging, through the purchase of the Industrial Furnace Division of Eclipse Fuel Engineering Company, Rockford, Illinois.

Hevi-Duty will manufacture and sell all types of furnaces formerly built by Eclipse and will provide service and replacement parts for any Eclipse furnaces now in operation.

The acquisition will enable Hevi-Duty to better serve the growing needs for industrial heat. For more information, call your nearest district office or write Hevi-Duty Electric Company, Post Office Box 563, Milwaukee 1, Wisconsin.

- **Heat Processing Furnaces**
- **Dry Type Transformers**
- **Constant Current Regulators**

HEVI-DUTY ELECTRIC CO.
Milwaukee 1, Wisconsin

Welding

Maintenance men join casting and welding

Arc welding and centrifugal casting can go hand in hand. Proof of this is a recent job by the maintenance shop of Lincoln Electric Co. This involved building a 1½-ton hydraulic press cylinder for a special machine.

Plant engineers needed the soundness of centrifugal castings However, these castings presented

Submerged arc welder builds-up the centrifugal casting.

a problem. The cylinder required flanges on either end. Centrifugal casting doesn't lend itself to casting flanges.

The economical solution to the problem was to obtain a casting with no flanges. Then flanges were built-up with weld metal.

Quite A Job — Putting on the flanges was a substantial operation. The cylinder itself was 10½-ft long, 22-in. diam. It had 2-in. thick walls. The flanges were an additional 2-in. thick. And they extended back 7 in. for each end. Each flange when completed contained about 160-lb of weld metal. Submerged arc welding did the job.

An outside shop received the cylinder after welding. It honed the ID, which shrunk 0.050 in. at the ends during welding, to finish size. It also drilled and tapped bolt holes in the ends of the flanges.

NEW FILMS

"Highway Hearing" introduces "pro" aspects of the $51-billion Federal highway program. Aimed at the general public, it could help executives of firms affected. Since the law states public hearings are a must when its roads bypass or pass through a community, implications to companies' managements are obvious. Many firms may be in such communities. What's more, it's a good lesson in real public relations. 28½ min. 16 or 35mm, color, sound. (Sponsored by the Dow Chemical Co., Midland, Mich.) Modern Talking Picture Service, 21 W. 60th St., New York 23.

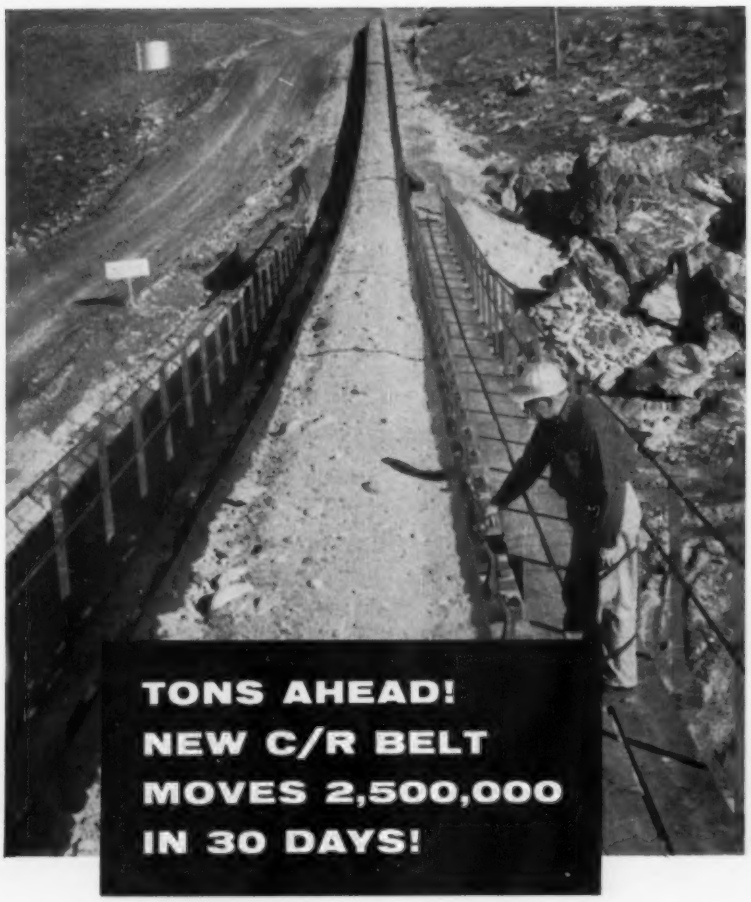
"Forming for Uniformity" covers making of welded tubing from beginning to end. Raw material refining starts it; inspection and packaging end it. A key part shows many non-destructive test methods which assure uniform finished pipe and tube. 30min. 16mm color, sound. Sales Promotion Dept., Alloy Tube Div., Carpenter Steel Co., Union, N. J.

"It's Easy To Bend" shows a rotary bending machine at work in a metalworking shop. 17min. 16mm, color, sound. O'Neil-Irwin Mfg. Co., 555 8th Ave., Lake City, Minn.

"A Production Cut-Off Band Saw" features a rugged 24-in. capacity power saw. It cuts billets, rails, bars and structurals. 10min. 16mm, color, sound. The DoAll Co., Des Plaines, Ill.

"Heart of Instrumentation" contains a brief history of galvanometers and oscillographs. 25min. Color, sound. Paul Gregg, Advertising Dir., Midwestern Instruments, Inc., P. O. Box 7186, Tulsa, Okla.

"High Production Press Maintenance" tells how to get more out of your high-speed presses. 25min. 16-mm, color, sound. Advertising Dept., E. W. Bliss Co., 1375 Raff Rd., S. W., Canton, Ohio.



"Miracle fiber muscle" has helped revolutionary C/R conveyor belting set new world records in aggregate handling! At Great Salt Lake, where Hewitt-Robins developed an amazing 2-mile bulk materials handling system, these new C/R belts, **speeding at 850 feet per minute** and sometimes handling over 6,000 tons per hour, have established a new world record of 2,500,000 tons in 30 days!

Hewitt-Robins research, engineering, and field experience have utilized latest advances in "miracle fibers" to produce a new C/R conveyor belt which far surpasses ordinary types of synthetic and natural fiber reinforced belting. Only Hewitt-Robins C/R conveyor belts, with higher tensile strength, lower stretch, increased flexibility, fatigue resistance, and the toughness contributed by these miracle fibers, could establish this record.

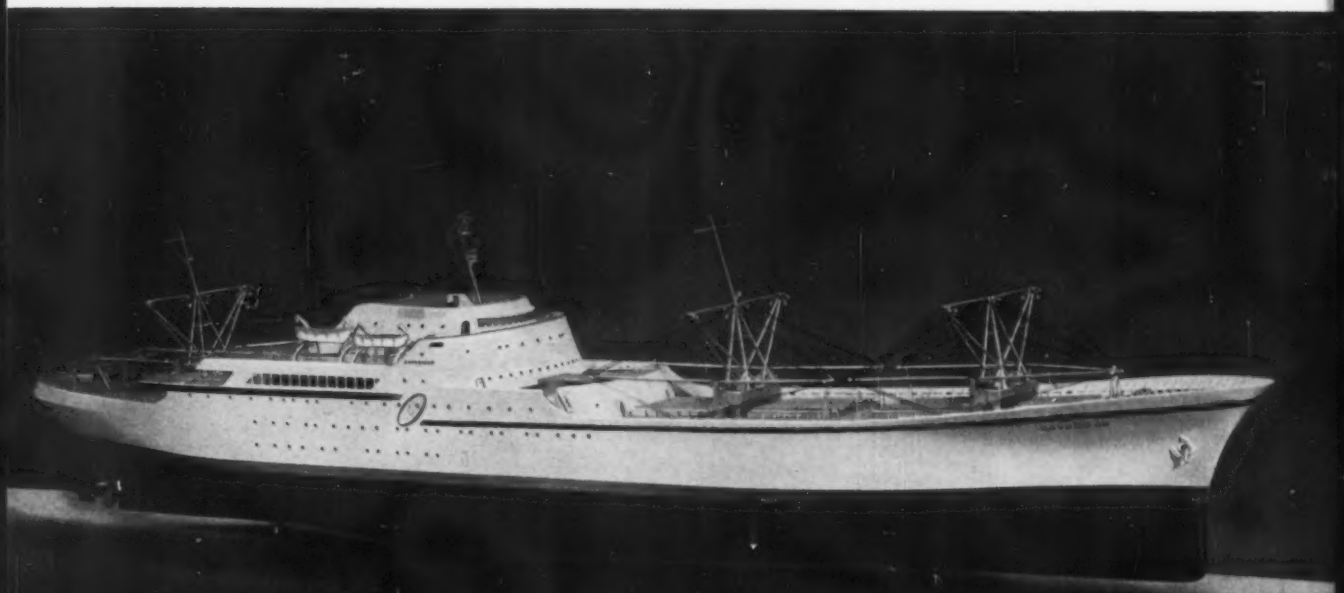
Whether your problem is moving mountains, mining ore, transporting coal, or feeding furnaces, specify a modern H-R miracle fiber C/R belt. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Conn.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS... POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE... VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

H-R Product Manufacturing Plants in Buffalo, N. Y. • Chicago, Ill. • King of Prussia, Pa. • Passaic, N. J. Amsterdam, Holland • Johannesburg, South Africa • London, England • Montreal, Canada • Paris, France

Creative Engineering by DE LAVAL



One of the U.S. Government's exhibits at the Brussels World's Fair is the model of the first nuclear ship, the N/S SAVANNAH, shown above.

The De Laval Steam Turbine Company is proud to play an important part in the design and construction of this 22,000 shaft horsepower vessel, the keel of which was laid on May 22, 1958, Maritime Day, at the New York Shipbuilding Corp. in Camden, New Jersey.

Under the joint sponsorship of the Atomic Energy Commission and the U. S. Maritime Administration, major contributions to the design and construction of the vessel and its machinery are being made by:

- *George G. Sharp, Inc., naval architects, designers of the vessel*
- *Babcock & Wilcox Company, designers and builders of the pressurized water reactor and its accessories*
- *New York Shipbuilding Corp., Camden, N. J., builders of the vessel*
- *De Laval Steam Turbine Company, designers and builders of the main propulsion machinery, other engine room auxiliaries; coordinators of all engine room equipment.*

We are particularly happy to serve in connection with this project of international importance. De Laval has often performed other important services as complete engineering coordinators, and is fully prepared to undertake similar assignments.

DE LAVAL *Steam Turbine Company*

899 Nottingham Way, Trenton 2, New Jersey

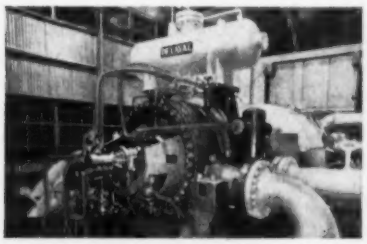
More Ways

DE LAVAL

Creative Engineering Serves Industry

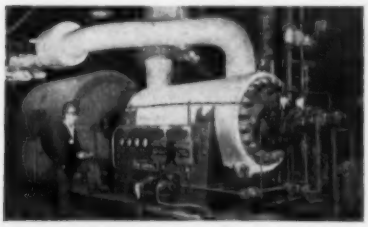
Centrifugal Compressors for Refineries

Shown here is a De Laval 10,200 H.P. turbine-driven main air blower handling 83,000 cubic feet per minute at the Ashland Oil & Refining Co., Ashland, Ky.



Extra Flexibility for Gas Pipelines

Creative engineering developed new De Laval Series-Parallel centrifugal compressors to meet booster stations' demand for exceptional flexibility.



Rugged Feed Pumps for Public Utilities

De Laval couples *creative engineering* and precision manufacturing methods to produce multi-stage centrifugal pumps for boiler feed service—built to handle pressures up to 5,500 pounds. This is an 11-stage unit in the Astoria Station of Con Edison.

Investigate the advantages of De Laval's *creative engineering* in refinery and pipeline compressors, steel mill blowers, ship propulsion units and marine auxiliaries, turbine generators, IMO pumps, worm gearing, planetary gearing and diesel engine turbochargers.

Send today for 48-page booklet—"Men, Machines and Materials at DE LAVAL."

De Laval Steam Turbine Company
899 Nottingham Way, Trenton 2, New Jersey

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 121.

Recessing Tools

Recessing tool applications in low-cost automation are highlighted in a 16-page catalog. Tools include: recessers, borers, reamers, grinding fixtures and arbors, torus design adjustable precision bore gages, lead-screw type precision boring heads, scroll-type boring heads, boring and facing heads. (Maxwell Industries, Inc.)

For free copy circle No. 1 on postcard, p. 121

Rubber Abrasives

Rubberized abrasives covered in an 8-page catalog handle deburring, smoothing and polishing. Rubberized abrasive wheels, points, blocks, sticks and cones are reviewed. (Cratex Mfg. Co.)

For free copy circle No. 2 on postcard, p. 121

Custom Rods

Custom-made rods are presented in a 4-page brochure. It gives data on available lengths, diameters, thread lengths, head styles and sizes, and materials used to produce custom cold form rods. (Brainard Rivet Co.)

For free copy circle No. 3 on postcard, p. 121

Tools, Sharpeners

How to use cutting tools to best advantage is discussed in a booklet. It explains importance of angle, shape and finish. Contained are formulas for determining speeds and feeds. One section has diagrams of single point boring tools. (Heald Machine Co.)

For free copy circle No. 4 on postcard, p. 121

Manual Welding

Proper care of arc-welding circuits cuts costs, says a 24-page bulletin. This publication points out what can be done to keep electric arc-welding circuits operating properly. (Lenco, Inc.)

For free copy circle No. 5 on postcard, p. 121

Drills, Reamers

Solid carbide drills and reamers are dealt with in a bulletin. Drills are No. 60 to ½ in. and reamers, 1/16 to 3/8 in. (For free copy write on company letterhead to M. A. Ford Co., 1545 Rockingham Rd., Davenport, Ia.)

Mechanical Presses

Single action, straight-side, single crank presses are featured in an 8-page bulletin. Capacities: 60 to 400 tons. (Federal Machine & Welder Co.)

For free copy circle No. 6 on postcard, p. 121

Cobalt Alloys

Two 16-page booklets contain properties of cast, cobalt base, high temperature alloys. (Haynes Stellite Co.)

For free copy circle No. 7 on postcard, p. 121

Electric Furnace

Features of an elevated heating chamber, electrically heated, con-

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428 Blue Ridge Road
Phone: Humboldt 6563
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4030 Chouteau Ave.
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Davidson Steel Corp.
444 Madison Avenue
Phone: Plaza 9-7151
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New York 22
McInnes Steel Co.
444 Madison Ave.
Phone: Oxford 7-8998
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100% QUALITY CONTROL

McInnes STEEL CO.
CORRY, PENNSYLVANIA
. . . SINCE 1895

FREE LITERATURE

veyor furnace are discussed in a bulletin. It says this furnace handles 3 to 5 times the loads of comparable units. (C. I. Hayes, Inc.)

For free copy circle No. 8 on postcard, p. 121

Bearing Alloys

A 4-page brochure lists bronze alloys most commonly used for bushings and bearings. It gives alloy or ingot number, grade and the properties of 24 alloys. Listed are military, SAE, Navy, Aeronautical, ASTM and Federal specifications. (Renewal Service, Inc.)

For free copy circle No. 9 on postcard, p. 121

Heat Treating

Heat treatments in atmosphere furnaces are discussed in an 8-page brochure. It covers furnace annealing, brazing and hardening of a wide variety of metals. (Ferrotherm Co.)

For free copy circle No. 10 on postcard, p. 121

Bridge Cranes

An 8-page catalog describes top running, double bridge, motor-driven cranes. They have a safety factor of 5 to 1. Capacities are 1 to 10 tons, spans up to 50 ft. (Wright Hoist Div., American Chain & Cable Co.)

For free copy circle No. 11 on postcard, p. 121

Secondary Machines

Five circulars describe automatic and semi-automatic second operation machines. The units handle production on cold-headed and forged bolts, cap screws, lag screws, valves, aircraft, automotive, and similar products. (Economy Engineering Co.)

For free copy circle No. 12 on postcard, p. 121

Slitting Knives

Rotary slitting knives are featured in a 48-page bulletin. Also covered: trimming knives, spacers, pipe and tube cut-off knives, scarfing tools, edging rolls, forming rolls, single plug and multiple roll forming tools, scrap chopper blades; also standard and special types of high

IF IT'S A **RITCO** FORGING

Ritco also offers complete machining facilities and makes Special Fasteners and Upsets of ferrous and non-ferrous metals. Send us your requirements.

IT'S A CLEANER PART!

Faster assembly and minimum machining are but two of many savings you make when you specify Ritco "Bright Finish" Forgings.

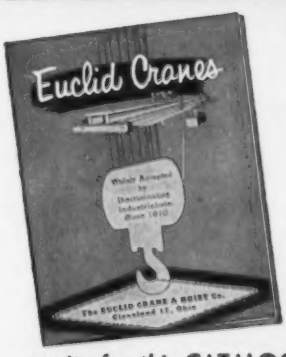
Made to close tolerances, highly accurate Ritco Forgings have a smooth, flawless finish free of flash, voids or blow holes. They save hours of time and trouble on product finishing and assembly. You'll find, too, that their dense, fibrous structure and controlled grain flow add greater strength and toughness to points of shock . . . assure maximum impact resistance and fatigue strength.

Write Ritco into your product specifications now. Ritco Forgings are produced in a wide range of metals and alloys, and in many designs.

Send us your blueprints now for estimates at no obligation!

RHODE ISLAND TOOL COMPANY
Member Drop Forging Association
144 WEST RIVER STREET • PROVIDENCE 1, R. I.

Built "UP TO A STANDARD"... not "DOWN TO A PRICE"



Write for this CATALOG

26 pages of informative data and complete information on many Euclid Cranes depict how our cranes will benefit your material handling, manufacturing and assembling operations.

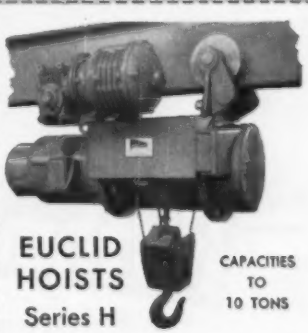
EUCLID CRANES and HOISTS
ACCLAIMED BY INDUSTRY FOR
HIGHEST QUALITY • RELIABLE PERFORMANCE • MINIMUM MAINTENANCE

An investment in a Euclid Crane pays off many times in reliable, trouble-free service for an unusually long period of time.

Standard models in a wide range of capacities, styles and spans generally meet average requirements.

A Euclid proposal on a custom crane to your specific needs is available without obligation.

HOIST LITERATURE IS AVAILABLE UPON REQUEST



EUCLID HOISTS Series H
CAPACITIES TO 10 TONS

The EUCLID CRANE AND HOIST Co.
1361 CHARDON RD. • CLEVELAND 17, OHIO

A RUTHMAN

GUSHER Coolant Pumps

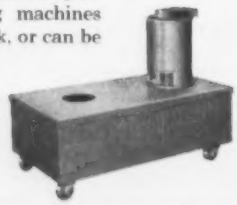
There is a type and model of Ruthman Gusher Coolant Pump to fit virtually every requirement; Immersed Type, Pipe Connected, Flange Mounted, and Shaft or Pulley Driven. Precision built of the best materials, Gusher Pumps offer you very distinct advantages. The shafts are electronically balanced to reduce vibration and wear. There are no seals to require constant replacement. No packing or priming is needed. Capacities from 1/30 to 7½ H.P.

Model UL

PUMP for every

GUSHER Tank Units

Offering you great versatility of movement; Gusher Tank Unit Coolant Pumps can either be mounted permanently on metal-cutting machines without built-in coolant tank, or can be equipped with casters for complete portability. Every metal working plant—large or small—should have a Gusher Tank Unit for emergencies. Capacities 1/30 to 7½ H.P. 4 gal. tank capacity and up.



Model 9050
Tank #2-4808

APPLICATION

RUMACO Seal Pump

Precision built Rumaco Pumps offer you the same advantages built into all Ruthman Pumps. A seal type pump, the Rumaco can be mounted anywhere. Rumaco pumps are adaptable to a wide variety of applications where a centrifugal pump is needed. Capacities 1/10 to 7½ H.P.

Model 5-3

Before you buy — compare our quality . . . prices.

Write for catalog

THE Ruthman MACHINERY CO.

• COOLANT PUMPS
• CIRCULATORS • AGITATORS
• MOLTEN METAL PUMPS

1809-1823 READING ROAD, CINCINNATI 2, OHIO

FREE LITERATURE

speed steel and carbide tipped milling cutters. (Cowles Tool Co.)
For free copy circle No. 13 on postcard, p. 121

Tubing

Plastic and coated insulation tubing is shown in a 4-page publication. It includes samples; specifications; temperature, size and color data. (William Brand & Co., Inc.)
For free copy circle No. 14 on postcard, p. 121

Switch Control

Photoswitch light controls are discussed in a bulletin. It introduces automatic on-off control for any lighting system whose operation should be keyed to outdoor light conditions. (Electronics Corp. of America.)
For free copy circle No. 15 on postcard, p. 121

Science Facilities

A new booklet is a guide for evaluating educational science facilities. It aims to tell you if they can fulfill today's requirements. (Scientific Apparatus Makers Assn.)
For free copy circle No. 16 on postcard, p. 121

Cut, Grind Fluids

Cutting and grinding fluids are described in a 12-page booklet. Three oil-type and three water-type lubricant - coolants cover virtually every metal-removal need. (Keystone Lubricating Co.)
For free copy circle No. 17 on postcard, p. 121

Pumps, Motors

Hydraulic pumps and fluid motors are featured in a catalog. Oil hydraulic pumps come in seven models; capacities are 1.2 to 14.2 gpm. Spur gear hydraulic motors handle continuous pressures to 1500 psi. (Tuthill Pump Co.)
For free copy circle No. 18 on postcard, p. 121

Jib Cranes

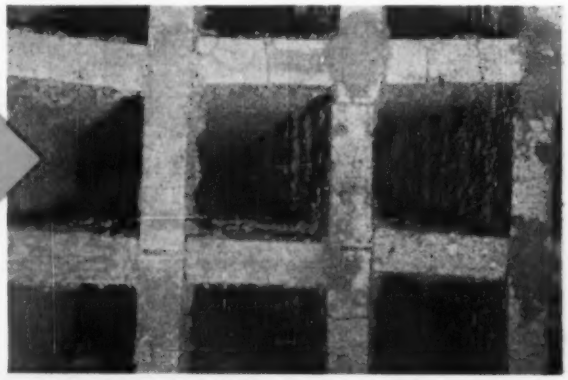
Pillar type jib cranes outlined in a 4-page folder come in ¼ to 6-ton capacities. (Wright Hoist Div., American Chain & Cable Co.
For free copy circle No. 19 on postcard, p. 121

HARBISON-WALKER

FORSTERITE L CHECKERS

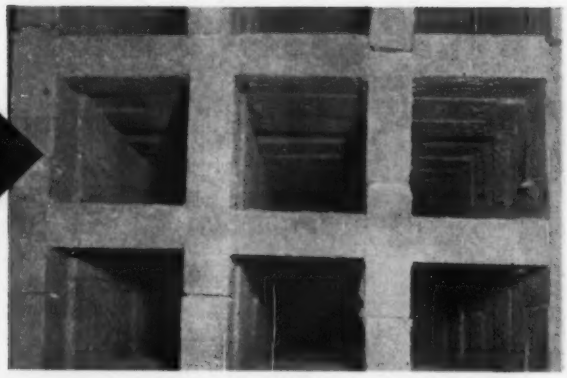
LIKE NEW AFTER 1105 HEATS!

AFTER THE FIRST TWO CAMPAIGNS—378 HEATS the Forsterite L Open Hearth checkers looked like this—



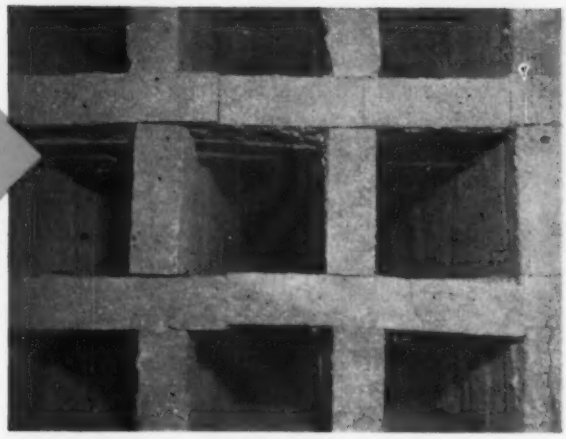
The friable character of the slight dust build-up is evident in this photograph.

CLEANED AND READY TO GO BACK INTO SERVICE they looked like this—



Cleaning is quickly and easily accomplished because Forsterite L Checkers resist slagging, spalling and clogging.

AFTER 1105 HEATS— cleaned and ready for more service—they still look like new!



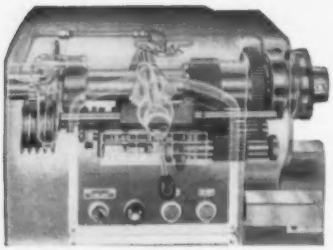
The amazing durability of this magnesium-silicate refractory brick is clearly shown by the pictures. Furthermore, the mineral forsterite has inherent properties which give the checkers exceptionally high heat capacity. The results are longer life, easier and less frequent cleaning, and greater thermal efficiency of the checker settings.

World's Most Complete Refractories Service

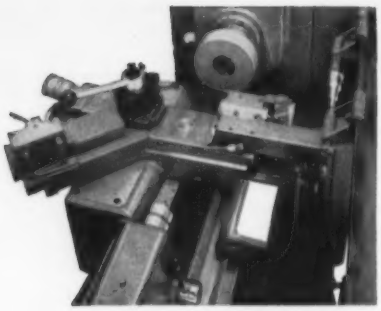
HARBISON-WALKER REFRACTORIES CO.
AND SUBSIDIARIES
GENERAL OFFICES: PITTSBURGH 22, PENNA.

BIG

lathe features at low cost!



Full 5 HP—all spur gears—anti-friction bearings—automatic filtered lubrication—9 spindle speeds to 3000 RPM.



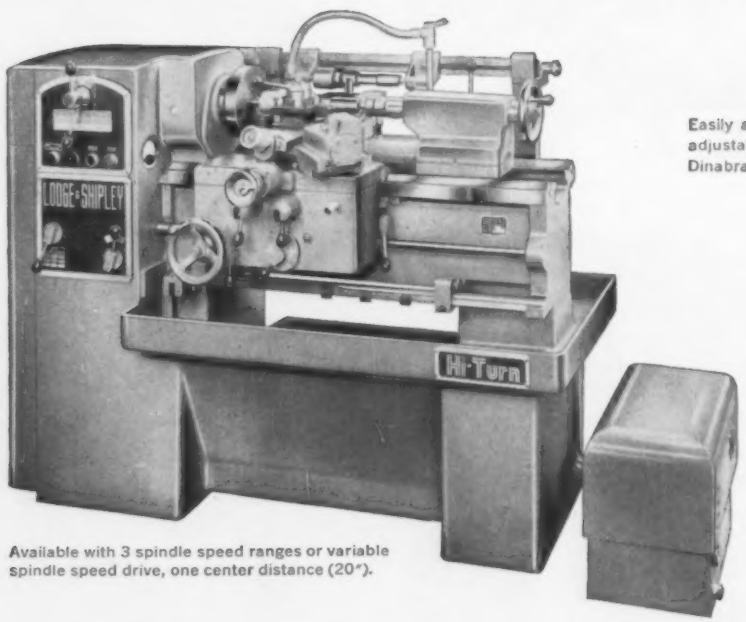
Compact, efficient 45° tracing mechanism—trouble-free, exclusive Lodge & Shipley design.

why pay $20,000 when you can buy a LODGE & SHIPLEY 1307 (10")

Hi-Turn COPYMATIC

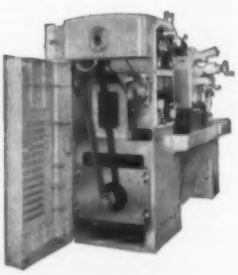
TRACER LATHE for less than $10,000?

Template-type multiple length stops for duplicating shoulder lengths.



Available with 3 spindle speed ranges or variable spindle speed drive, one center distance (20").

Easily accessible and adjustable drive with Dinabrake motor.



Simple set-up for contour facing operations.

The **HI-TURN 45° COPYMATIC Tracer Lathe** is extremely rugged, built to do production jobs at time and money-saving rates. You get Lodge & Shipley quality features at a price substantially below many lathes having less horsepower and light construction. If you perform manufacturing or tracer lathe operations, put them on a lathe built to do the job at lowest cost. The features shown here are but a few of many . . . for complete details, request Bulletin DM-4 from:

The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Mill Control

A 4-page bulletin discusses ac auxiliary controls for metal rolling and processing industries. Units have power use levels to 600-v. (General Electric Co.)

For free copy circle No. 20 on postcard

Automated Tools

Automated special machine tools appear in a 20-page catalog. These units are for low, medium and high-production work. (Snyder Tool & Engineering Co.)

For free copy circle No. 21 on postcard

Packing, Shipping

In its 18th edition, a catalog is full of ideas to improve packaging and shipping. This pocket size 48-page booklet recommends methods for shipping by rail, truck or intra-plant handling. (Signode Steel Strapping Co.)

For free copy circle No. 22 on postcard

Control Panels

Control panels for metal rolling and processing industries are featured in a 4-page bulletin. Special features of NEMA Class A, B, C, D, and NEMA 1 enclosed panels are listed. (General Electric Co.)

For free copy circle No. 23 on postcard

Direct Reduction

A new direct-reduction and beneficiating process is described in a 12-page brochure. This process treats iron ores to produce metallic iron briquettes. These can be fed directly to electric, open hearth or blast furnaces. It uses low cost fuels and may up-grade a wide range of iron ores, both magnetic and non-magnetic. This can make vast tonnages of low-grade iron ores commercially usable. (R-N Corp.)

For free copy circle No. 24 on postcard

Heat Treating

Hardening, pre-heat, high speed steel, tempering, and vertical furnaces are outlined in a 12-page brochure. (C. I. Hayes, Inc.)

For free copy circle No. 25 on postcard

Testing

A brochure presents extensive facilities of an environmental test lab. Tests can include temperature extremes, sand and dust, humidity, fungus, salt spray, shock, vibration, altitude, explosion and many others. (Bowser - Morner Testing Labs., Inc.)

For free copy circle No. 26 on postcard

Handling

Factors to consider in setting-up a materials handling program are outlined in a brochure. (Automatic Transportation Co.)

For free copy circle No. 27 on postcard

Marking, Fabricating

Precision marking and fabrication of metals, plastics and phenolics is discussed in a 4-page pamphlet. It covers the manufacture of dials, scales, panels and instruction plates. (Gray Pantograph Engraving Co.)

For free copy circle No. 28 on postcard

Fasteners

Fasteners described in a data sheet contain "exotic" metals. It tabulates 11 available metals and their properties. (Huck Mfg. Co.)

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Stainless and Food

A 44-page booklet relates data on food preparation and serving with stainless steel equipment. It

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **8/21/58**

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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

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FREE LITERATURE

includes material on fabrication. A table lists corrosion resistance of varous steels to specific media. (Allegheny Ludlum Steel Corp.)

For free copy circle No. 30 on postcard

Oxygen Analyzer

Continuous and automatic, a new unit analyzes dissolved oxygen in high purity water. A 4-page bulletin describes it. (Beckman Process Instrument Div.)

For free copy circle No. 31 on postcard

Welder Control

Precision units covered in a bulletin control tri-phase electric resistance spot welders. Controls particularly suit dc rectifier welders mechanically run by air or hydraulic fluids. (Taylor-Winfield Corp.)

For free copy circle No. 32 on postcard

Lubricants

Planned lubrication is discussed in a bulletin. It lists correct lubricants for specific types of equipment. The 20-page bulletin also tells how many requirements can be met with a minimum of different lubricants. (Keystone Lubricating Co.)

For free copy circle No. 33 on postcard

Titanium Pipe

Properties, fabrication of, and corrosion resistance of titanium tubing and pipe are reviewed in a bulletin. (Alloy Tube Div., Carpenter Steel Co.)

For free copy circle No. 34 on postcard

Strong Steel

A 20-page booklet analyzes three high strength, low alloy steels. They come in sheets, plates, bars, and most structural shapes. (Kaiser Steel Corp.)

For free copy circle No. 35 on postcard

Cranes

Combined with a hand or electric hoist, a top running, single bridge, hand traveling crane is for jobs where accurate spotting is more important than fast travel speeds. A 4-page folder lists lifting capacities in tons, widths of spans in feet, specifications and general features of the crane. (Wright Hoist Div., American Chain & Cable Co.)

For free copy circle No. 36 on postcard

Steel Belts

Steel-belt conveyors' handling of metal and ceramic parts at AC Spark Plug Div. of General Motors Corp. is discussed in new literature. (Sandvik Steel, Inc.)

For free copy circle No. 37 on postcard

Steel Conveyors

Piano hinge steel belt conveyors are outlined in a brochure. These conveyors are formed from close tolerance stampings. They come in various thicknesses and widths. Close tolerance and piano hinge construction eliminates problem of material catching or jamming any part of the conveyor. (Prab Conveyors, Inc.)

For free copy circle No. 38 on postcard

Colloidal Graphite

"The ABC's of Colloidal Dispersions" contains 12 pages of answers to questions frequently asked about colloids. (Acheson Colloids Co.)

For free copy circle No. 39 on postcard

Steel-strap Unit

An 8-page booklet is devoted to a pneumatic steel-strapper. The steel-strapping tool performs tensioning, sealing and cutting all by air power. (Acme Steel Co.)

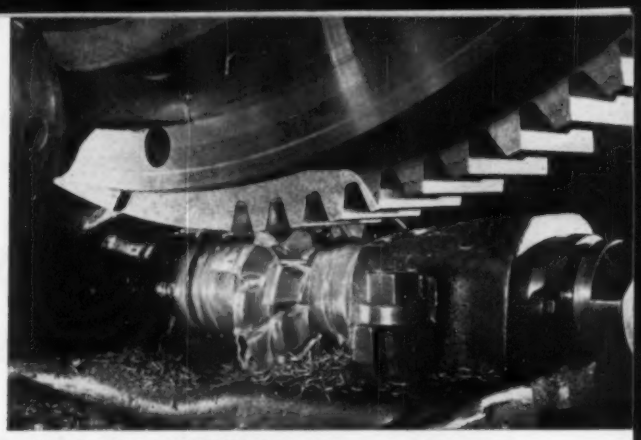
For free copy circle No. 40 on postcard

Surface Roughness

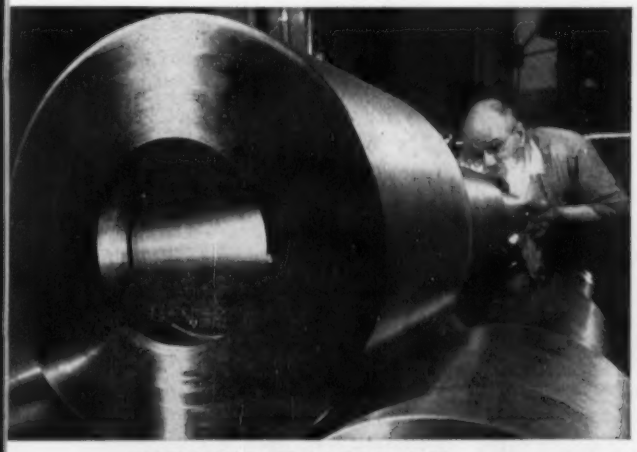
A 4-page bulletin says it's foolish and expensive to argue about surface roughness. Reason it gives is that surface measurement is no longer a matter of judgment and opinion. Instead, it can be specified in microinches and measured with a handy portable Profilometer. (Micrometrical Mfg. Co.)

For free copy circle No. 41 on postcard

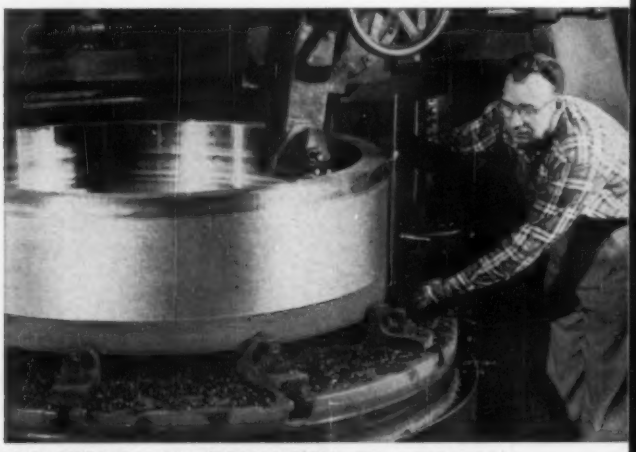
SAVES $150 PER GEAR—In cutting a double-web design fabricated gear on a gear generator, tool cost formerly averaged $180 per gear. By switching to ALCO Hi-Qua-Led Steel with its lower friction component, tool wear is reduced, and manufacturer reports savings of approximately $150 per gear.



8-HOUR JOB DONE IN 3—Another manufacturer reports that roughing and finishing a gear required a total of 8 hours and 8 minutes on his gear cutter. With freer-machining Hi-Qua-Led Steel and the increased speeds and feeds it permits, the job is now completed in just 3 hours and 10 minutes.



700% INCREASE IN TOOL LIFE—In trepanning a 4 in. diameter hole 42½ in. long with a Warner & Swasey lathe, tool life averaged one piece per tool. With Hi-Qua-Led, 8 pieces are now obtained with the same tool. Manufacturer reports that Hi-Qua-Led Steel also provides much better chip formation.



TOOL DOES 3 TIMES THE WORK—With Hi-Qua-Led Steel, a King boring mill operation that once required 3.4 hours is off the machine in 43 minutes. Through the lower frictional properties of Hi-Qua-Led Steel, the manufacturer obtains 10 pieces per tool grind as compared to 3 pieces obtainable with non-leaded steel.

HOW ALCO'S EASY-MACHINING HI-QUA-LED STEEL* FORGINGS CAN CUT YOUR PRODUCTION COSTS

The easy machinability of ALCO's Hi-Qua-Led Steel® forgings is setting new production records throughout industry. In case after case, a switch to Hi-Qua-Led Steel forgings has resulted in greatly reduced machine time, longer tool life and improved surface finish with closer tolerances.

These unique cost-cutting benefits are provided by Hi-Qua-Led Steel forgings with all the other physical characteristics of regular steel in the same AISI grade. You get the same service in your end product.

ALCO specialists will be happy to demonstrate these profit-boosting characteristics on your own machines, in your own plant. Forgings are available in seamless rolled circular shapes from 18 to 145 in. OD, in open-die shapes from 1,000 to 30,000 lb and 40 ft long, and in mandrelled seamless circular shapes up to 60 in. wide.

For a technical booklet on Hi-Qua-Led Steel forgings, write ALCO Products, Inc., Dept. 155, Schenectady 5, N. Y.

***HI-QUA-LED STEEL**—ALCO's registered trademark for its special process leaded steel forgings that are making outstanding reductions in machining time, tool wear and production costs

ALCO

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NEW YORK

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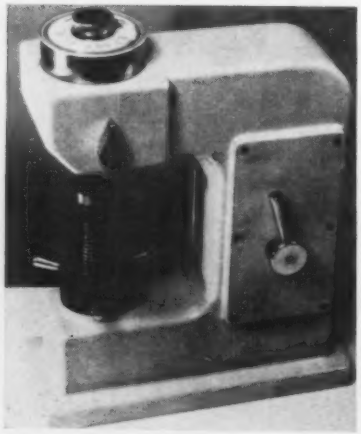
New Production Ideas

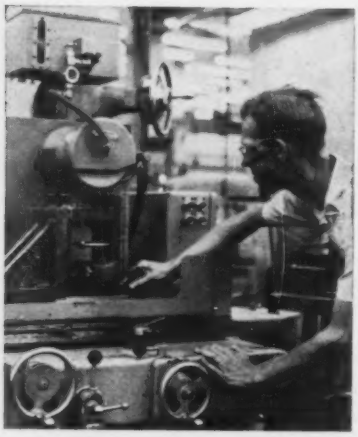
Equipment, Methods and Services



Tester Gives Microhardness (Vickers) Readings

Microhardness readings can be taken without a microscope with a new tester. Using a frictionless hydraulic method, the tester loads a diamond indentor; this supplies a direct reading within 15 seconds. A large, easy to read dial indicates hardness numbers from 100 to 1000, corresponding to the Diamond Pyramid Hardness Method (Vickers). The tester comes in 1 or 2-kg loads, penetrating as little as 0.002 mm or 0.004 mm respectively. Because of the microhardness tester's simple design and absence of complicated mechanisms its price is relatively low. It permits fast precision readings on watch and instrument parts, surface layers, thin materials, small wires, tips of cutting tools, surgical needles, wire punches, small precision parts and similar items. (Newage Industries, Inc.

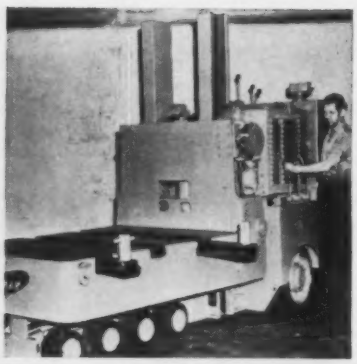
For more data circle No. 42 on postcard, p. 121



Surface Grinder Offers High Table Speeds

A substantial increase in table speed lets this new surface grinder handle jobs in half the time it takes some other machines. The 6 x 18-in. hydraulic unit has a maximum table traverse speed of 125 sfpm. In addition to cutting grinding time, the high maximum table traverse speed reduces burn, checking and cracking of the work. This is particularly true when grinding heat sensitive steels. Another key feature of the unit is its capacity. It'll grind a workpiece as high as 15 in. above the work table with a standard 8-in. diam grinding wheel. The two hand scraped flat ways of the base are long and wide; this results in low bearing pressure per square inch; hence, long wear. Straight cross tracking of the saddle results from a unique guide rail and preloaded ball bearing roller construction. Long vertical ways give rigid support even at the maximum 15-in. height. (Norton Co.)

For more data circle No. 43 on postcard, p. 121



Trucks Position Dies From Either Side

Newly developed 20,000-lb capacity die handling trucks can position dies on and off either side, or the end of the platform. Handling dies from the side permits stationing vehicles parallel with presses in narrow aisles. Trucks have a single stabilizer bar; this easily pushes out from either side of the platform for butting against the press. In tests, with a truck so positioned, a 20,000-lb die was pulled onto the truck platform with negligible lateral truck deflection. In addition, no lateral movement was encountered in transferring this same die from the truck to the press bed. Trucks are designed to handle Kirksite dies, too. (Elwell-Parker Electric Co.)

For more data circle No. 44 on postcard, p. 121

Cutting Fluid

Sulphur-free, a heavy-duty cutting fluid can be used with ferrous and nonferrous metals. The compound acts in a heat limiting capacity on low and medium tensile steels. It keeps interface temperatures below the critical point. Thus it retards tool wear. The material is equally effective on nonferrous metals and alloys, including copper, brass, aluminum, etc. (United Laboratories, Inc.)

For more data circle No. 45 on postcard, p. 121

Barrel Finishing

Vibration-free operation is a key feature of new barrel finishers. The precision units have a molded fiberglass safety gate. This is corrosion-proof. Its light weight means easy operation. Full-opening doors on

the cylinder provide convenience in loading, unloading and cleaning. Doors are "super-sealed" by special cam locks. These operate on only 90° of turn; they exert high-compression pressure on Neoprene door seals. (Wheelabrator Corp.)

For more data circle No. 46 on postcard, p. 121

Overhead Conveyors

Compact design of a new overhead conveyor gives more headroom. A variable-speed caterpillar drive for the overhead trolley conveyor is a real space saver. By mounting the drive sprocket directly on the slow speed shaft of the vertical-type reducer, the builder eliminates the once-used bulky spur gear and pinion. (Alvey-Ferguson Co.)

For more data circle No. 47 on postcard, p. 121

Lightweight Nuts

Up to 72 pct of the weight of locknuts used for structural skin and panel assemblies can be saved with a new featherweight locknut. So states its maker. The cold-forged nut can be used with existing aircraft bolts. Tensile strength is 125,000 psi. (Standard Pressed Steel Co.)

For more data circle No. 48 on postcard, p. 121

Hydraulic Valves

All of one hydraulic valve maker's high-pressure units boast a new internal sleeve type construction. These diaphragm-operated valves serve hydraulic or cold raw water duty. They provide shockless performance and leakfree shut-off with little maintenance. (Sinclair-Collins Valve Co.)

For more data circle No. 49 on postcard, p. 121

as MAINTENANCE FREE as CRANES can be...

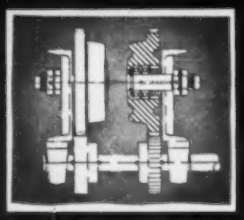
ABELL-HOWE

UNDERHUNG CRANES

now with

FORGED ALLOY STEEL WHEELS, GEARS and PINIONS

Only Abell-Howe offers you forged steel dependability at all critical points of wear —wheels, gears *and* pinions! Furthermore, Abell-Howe rugged outrigger construction keeps bridge in square—provides lateral bracing for bridge girder. Smooth fluid drive provides cushioned starts whatever the load—reduces reversing shocks. To further assure smooth operation and lasting service, anti-friction bearings used throughout—with double row ball bearings in end truck wheels. Here's crane value that can't be beat!



another ABELL-HOWE *plus*

"QUICKLOCK" WHEEL ASSEMBLIES

Combine positive wheel mounting with immediate removability. To remove axle, simply loosen two nuts, twist axle 90° and pull it out. Wheels, too, are as easily removed with no dismantling of truck frame. "QUICKLOCK" is exclusive with Abell-Howe.

Ask for **BULLETIN**

ABELL-HOWE COMPANY

7765 W. Van Buren St., Forest Park, Illinois

Sander Performs Dust-free Work on Soft Metals

For sanding soft nonferrous metals, wood and other materials, a new 3-in. belt sander works dust-free. This heavy-duty sander attaches to any standard industrial or domestic type vacuum cleaner to eliminate more than 90 pct of all dust and fine metals powder produced on the job. Not only does this keep the shop clean, but it allows more efficient sanding. Belt life can be extended, too. What's more, it permits sanding in an area where painters are at work. A foolproof timing belt drive provides smooth, quiet operation. It requires no lubrication, eliminating dripping of grease on the work. A flush side on the unit permits accurate sanding up to any vertical surface. And an extended front pulley provides for work on contours and small radii. Other dustless sander models come with a dust-collection unit. (Black & Decker Mfg. Co.)

For more data circle No. 50 on postcard, p. 121

Fork Lift Truck Has A Guaranteed Clutch

This 6000-lb pneumatic tire fork truck's clutch has an unconditional 12-month guarantee on it. The clutch is mounted in a horizontal position. This makes it fully accessible for plate change in 10 minutes or less. Wear is less than normal because the clutch runs at less than ½ engine speed. The truck itself is designed for easy maintenance. Its lubricating system is simple in design. Generous use of rubber mountings and sealed bearings hold down the number of hard to reach pressure fittings. In addition to eliminating grease points, the rubber mountings absorb road shocks; this cuts down on wear and tear. The power assisted clutch gives complete starting and inching control without the use of any costly and complicated fluid coupling or torque converter. Power steering is standard on the truck. It comes in both single and dual drive. (Pettibone Mulliken Corp.)

For more data circle No. 51 on postcard, p. 121

Universal Planer Cuts Coming and Cuts Going

This universal planer cuts, cuts and cuts. Not only does it offer cutting coming and going—there's no idle return stroke—but it also performs regular single cutting. It does conventional heavy-duty planing effortlessly due to a new square lock design. Its high power, rigidity and high speed entitle it to use latest carbide tools. By pulling a lever and pushing a button, the planer instantly converts to double cutting. This double-cutting technique can be combined with the regular single cutting action to get triple cutting. Rough and semi-finish planing are accomplished at the same time. Standard carbide tips are used in the simple double cutting tools. The universal planer comes in both double housing and openside designs. Many such units are now in wide use in plants where they do production work. (The G. A. Gray Co.)

For more data circle No. 52 on postcard, p. 121

Micrometer Readings Show-up In Window

True decimal readings are provided by a window-reading micrometer. Of West German make, the micrometer does away with "quarter" divisions of 25, 50 and 75 on the sleeve. Instead the sleeve bears only graduations in 10th of an inch. The 100ths are read through a window numbered 0-9; 1000ths appear on the thimble,

opposite the 10,000ths vernier, but perfectly flush with each other. (Opto-Metric Tools, Inc.)

For more data circle No. 53 on postcard, p. 121

Measuring Microscope

A new 20-power pocket-size inspection and measuring microscope has a superimposed scale. It contains an accurate, 4-lens optical system. This is inside a lightweight

metal casing. It provides a flat, undistorted field. The superimposed scale, with 0.002-in. graduations, is internal; it can't be scratched or smeared. (DuMaurier Co.)

For more data circle No. 54 on postcard, p. 121

Support Bushings

Compact roller bearing bushings can now replace bronze bushings in the outer support of horizontal milling machines where limited diameter requirements exist. The straight-type bushings' design makes practical use as inboard and outboard supports by cutting down loss of work area due to overhang. (Donley Products, Inc.)

For more data circle No. 55 on postcard, p. 121

Height Gage

A vernier height gage just introduced is designed to make layout and inspection work easier, faster and more accurate. It has a long, 50-division, flush-fitting vernier. A sensitive, full length slide adjustment has a quick-adjusting screw release. The unit's rugged, vibration-proof design features a natural grip base, with a fine adjustment knob on the base. It comes in 12, 18 and 24-inch sizes. (L. S. Starret Co.)

For more data circle No. 56 on postcard, p. 121

Clutch-Brake

Clutch-brake combinations are now obtainable as complete units with bearings, shaft, and mounting stand. Both clutch and brake are magnetically set, including a neutral position. They can be furnished with a common armature, splined to the driving shaft. Or they can have a common hub with separate armatures for clutch and brake, this keys the hub to the shaft, allowing zero backlash. Torques run from 25 in.-oz to 175 in.-lb on clutches and on brakes. (Stearns Electric Corp.)

For more data circle No. 57 on postcard, p. 121

WEBB PLATE FABRICATING MACHINERY

Steelworkers **ALL STEEL CONSTRUCTION**

DELIVERY 10 DAYS

The Webb Corporation, in presenting the line of new WEBB STEELWORKERS, has designed versatile machines for either job-work or high production work. These units have been engineered to meet the particular need of shops having a variety of work, with a result that all-purpose machines are now available.

Five Complete Tools are Incorporated in a Single Unit.

1. Punch for plate, bars or structurals.
2. Cuts angles and tees with straight or miter cut.
3. Cuts off round and square bars.
4. Shears plates and bars.
5. Coping or notching attachment.

One of the main features of these machines is that they are at all times in complete readiness to do any of the above operations and to do the work well.

The punch may be operated at the same time as either the section cutter, bar cutter, shear or the coping and notching attachment . . . therefore, two operators can work at this machine simultaneously without interference. For illustrated literature and prices, write Dept. E.

Let Speed PAY–The WEBB Way!

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PYRAMID TYPE ROLL

INITIAL TYPE ROLL

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WEBB CITY, MO., U. S. A.

facts about LEDLOY* FREE-MACHINING STEELS

The Inland process of adding lead to any steel improves machinability from 25 to 50% without affecting mechanical and metallurgical properties

Ledloy is Inland Steel Company's trade name for any grade of steel to which lead has been added to obtain greater machinability. Inland regularly produces Ledloy free-machining open hearth steels to a wide variety of chemical specifications to meet customer requirements. In each instance, regardless of the chemical composition, *the addition of lead by the Inland process results in no significant change in the desirable mechanical and metallurgical characteristics of the steel.* All the important qualities of open hearth steels, such as ductility, impact values, transverse strength, case hardening qualities and cross sectional soundness are retained. Any heat treating, or forging operation that can be performed on similar non-leaded grades of open hearth steels *can be performed* on Inland Ledloy free-machining steels.

What is affected, and to a marked degree, is machinability! Though Inland Ledloy steels contain only about one-quarter of one percent lead, distributed evenly throughout the steel, this small quantity of lead does amazing things to the steel's machinability. On-the-job use consistently shows cold drawn Ledloy can be machined 45% faster than B1113 and 100% faster than B1112. Surface speeds of 325 feet per minute are common and much higher speeds are possible; up to 450 sfm with high speed tools and up to 600 sfm with carbide tooling.

Not only is speed increased, but down-time for tool changes is markedly reduced. The reason is that Inland's process of adding lead to steel lowers the steel's friction component and actually lubricates the cutting tool during machining. Less heat is generated, tool-edge build-up is minimized and tool life is increased considerably.

Ledloy steels' shorter-length chips generally fall clear of the tool and Ledloy's lubricant characteristic aids in preventing chips from welding to the tool.

Ledloy steels are especially clean-cutting and machine to a fine, smooth finish — smoother than that obtained with other free-cutting steels—making dimensional tolerances easier to maintain. In practically all cases, Ledloy steels may be fabricated—sheared, bent, formed, torch-cut, welded, brazed—in the same manner used for steels of the same base chemical composition and with equal or better results.

Many grades available–Inland Ledloy free-machining steels are available in a wide range of standard carbon and alloy grades in bar form. Ledloy free-machining plates are also produced.

If your product requires machining, it will pay you to get all the details on Inland Ledloy . . . the original leaded steel. Ask your cold-drawer about it today, or write Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois, for the interesting booklet, "Properties of Inland Ledloy Steels."

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INLAND

Ledloy Steels

the world's most machinable

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The Iron Age Summary

Inventory Policies Turn the Corner

Reversal of inventory policies is largely responsible for continued pickup in steel demand.

But automakers, with a strike threat growing, are still holding off in their buying plans.

▪ Inventory cutting by steel users is over. Metalworking firms are beginning to see the light on inventories and consider further cuts too risky in view of unsettled conditions in the Mideast.

This reversal of inventory policy, coupled with continued improvement in the overall economy, is responsible for the steady pickup in steel demand.

Auto Labor Factor—The overall gains in the market offset continued reluctance by automakers and parts suppliers to come into the market for October tonnage. The lag in auto labor negotiations is now beginning to effect the steel market and is delaying complete recovery.

Automakers and their suppliers are still staying out of the market while the labor situation is unsettled, and will continue to hold out as long as they can while the strike possibility lingers.

Parts suppliers, hard hit by the poor 1958 auto year, are particularly hesitant about building inventory under present conditions. This is a dangerous game, but they are playing it out to the end.

Operations Climb—In line with the general improvement, one large mill expects August shipments to run about 20 pct better than July's, and September will show a further improvement of about 5 pct. The gain has come mostly in flat-rolled sheets and products used in construction.

Another producer has already booked for September as much tonnage as it shipped in June, which was the best month so far this year due to hedging against the expected price boost.

Bright Spots—The construction outlook is especially good. A steady rise in structural awards during the last several months will be reflected in a still better market for plate and structurals this fall.

Other bright spots in the steel sales outlook: Bigger crops have put more money in the farmer's bank account and he is buying more fencing, wire products, more materials handling equipment, and implements. Demand for oil country drill pipe and casing also will improve, partly because of the Mideast crisis.

Steady Recovery—Regardless of what happens in automotive, the steel market is well on its way to recovery. A steady improvement in the remaining months of 1958 is virtually assured.

And after that, steel users will begin worrying about the mid-1959 steel labor negotiations.

Uncertainty over how these labor talks will turn out will give a boost to steel ordering in the second quarter of 1959 as a hedge against a possible strike. Steel operations could hit 90 pct of capacity during this period.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,674	1,632	1,539	2,100
Ingot Index				
(1947-1949=100)	103.1	101.6	95.6	130.7
Operating Rates				
Chicago	78.0	71.0	64.0	83.5
Pittsburgh	53.0	53.0	49.0	81.0
Philadelphia	71.5	67.0	65.0	92.0
Valley	49.0	52.0*	47.0	71.5
West	70.0	69.0*	63.0	102.0
Cleveland	55.0	53.0*	50.0	88.0
Buffalo	47.0	54.0	39.0	95.0
Detroit	67.0	67.0	59.0	80.0
South	52.0	53.5	53.5	85.0
South Ohio River	72.0	72.0*	38.0	90.0
Upper Ohio River	82.0	77.0*	75.0	81.0
St. Louis	77.0	68.0*	90.0	79.0
Northeast**	...	...	36.0	37.0
Aggregate	62.0	60.5	57.0	82.0

*Revised
**For explanation, please see page 132.

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel base	6.188	6.188	5.967	5.967
Pig Iron (Gross ton)	$66.49	$66.49	$66.49	$66.40
Scrap, No. 1 hvy (Gross Ton)	$41.83	$41.83	$38.17	$53.00
No. 2 bundles	$29.50	$29.83	$27.17	$46.17
Nonferrous				
Aluminum ingot	26.80	26.80	26.10	28.10
Copper, electrolytic	26.50	26.50	26.50	28.50
Lead, St. Louis	10.80	10.80	10.80	13.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	95.25	95.25	96.125	94.50
Zinc, E. St. Louis	10.00	10.00	10.00	10.00

Foundry Equipment Bids Plentiful

Although foundry equipment sales are slow, machinery makers are busy answering requests to bid on future work.

If founders get busier it's expected these bids will change into orders.

▪ Sales of foundry equipment may be at their lowest ebb in a long time. But foundrymen are at least thinking about the new equipment they'd like to have. And this is a promising sign for salesmen. Meanwhile a new do-it-yourself trend in foundries is an added irritant for the machinery salesmen.

"Although business this year is running about half of last year for the industry, the dollar volume of bids we are sending out hasn't slipped at all," says C. O. Bartlett, director of sales for Bartlett & Snow, Cleveland foundry equipment builders.

Some Big Ifs—"All these bids could bear fruit later this year or next," he adds. "If volume of castings going through the foundries begins to go up and foundrymen feel their equipment will cost more in six months or so, then the improvements will be made. Most of the planned new equipment is built around improved plant layouts, materials handling systems, and different arrangements rather than any special new types of equipment."

Work for Idle Hands — Some foundry equipment sales officials also report that a do-it-yourself trend is gaining added momentum and cutting into plant activity. In some auto plants, maintenance crews, by union contract, must be offered erecting work ahead of builders' crews if the maintenance workers are not busy. In cases like this equipment makers sell the components but do not assume responsibility for the erection.

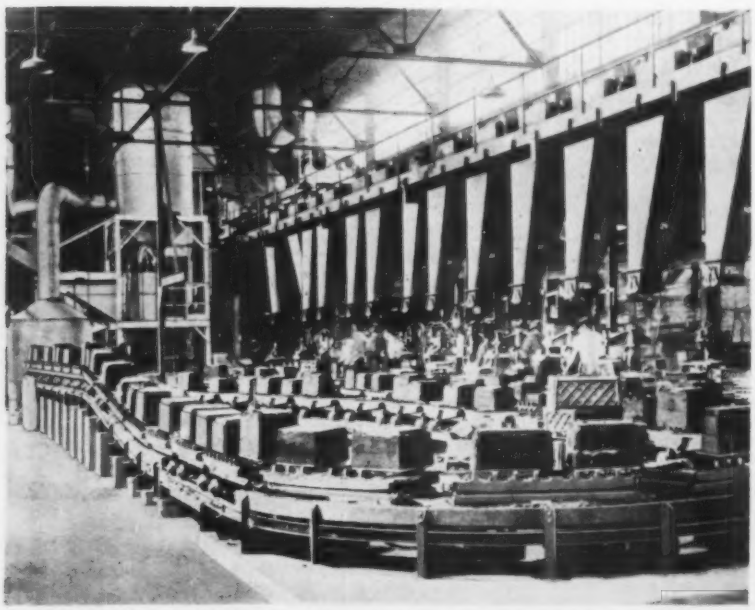
The next step some makers foresee is that maintenance crews will not only put up their foundry equipment but will build it. Some work like this has probably already been done.

Union Support — Behind the trend is the natural desire of foundry owners to keep their men working. In addition unions can write it into contracts to make it mandatory.

"Actually the trend is a very small factor at this stage in the game," one equipment sales manager says. "But with business slow, every minor irritant becomes a major one. It's getting far more attention than it is worth but it's something we're going to have to live with."

Long-Range Plans — While the short-term outlook still shows no sign of a pick-up, the long-term view is good. The foundry machinery outlook is, of course, directly hinged to the foundry industry generally. And, for the founders, customer inventories are nil, major users like automakers, railroad car builders and appliance manufacturers have been dormant for long periods.

However new merchandising methods being strenuously pushed through foundry associations stress better equipment for higher quality and lower costs plus better financing and office procedures.



CHAIN REACTION WANTED: As soon as the level of foundry business begins to move upward, foundry equipment makers say, their own sales will show quick improvement. (Photograph from C. O. Bartlett & Snow Co.)

J&L extra clean, smooth, bright wire in .306" diameter is used in this sturdy motor mount by E. H. Titchener & Company.

"Wire enhances motor mount appearance, dissipates noise"

... states wire products manufacturer

"The J&L wire we use in this motor mount for a large air conditioner has a bright, clean and smooth finish so necessary for high quality plating work.

"It also meets our rigid physical and welding quality specifications," reports Mr. Paul Titchener, president of E. H. Titchener & Company, Binghamton, New York, manufacturers of quality wire goods since 1886.

"This modern mount design takes advantage of the natural resiliency of wire construction. The mount weighs only 13 pounds, provides free flow of air, minimizes vibrations," according to Mr. Titchener.

J&L manufacturer's wire has a superior quality due to close control in every phase of production from ore mine to finished product.

Next time you order wire, call your J&L representative for a recommendation on the exact steel wire for your specific job. Or write direct to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J&L STEEL

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

Distributors Revise Quantity Discounts

Changes, both upward and downward, are announced by some steel service centers.

Producers list price increases for electrical alloy steels, and pressure and mechanical tubing.

▪ Distributor quantity discounts and extra charges are getting a radical overhaul.

The changes, some upward and some downward, will generally benefit the larger tonnage user. On large quantity orders (those above 5000 lb), increased warehouse discounts on most hot-rolled products will almost offset new base price increases.

However, on small quantity orders (those under 2000 lb) both base price and quantity extras have been revised upward.

The new discount schedules range from 40¢ more off per hundredweight in the 5000 to 9999 lb bracket, to 50¢ more off on orders over 30,000 lb. Base prices apply on orders from 2000 to 4999 lb.

Here are the new quantity discounts and extra charges, per hundredweight, on hot-rolled strip, bars, plates, and structurals:

Quantity	Present Discount	Previous
2-4999 lb-	base	
5-9999-	reduce 50¢	10¢
10-19,999-	reduce 75¢	30¢
20-29,999-	reduce $1	60¢
30,000 and over	reduce $1.50	$1

Quantity	Present Extras	Previous
100 lb	add $10	$9
100-399	add $7	$6
400-999	add $4	$3.50
1000-1999	add $1.25	$1

Meanwhile, steel service centers continue making base price increases. (Latest changes appear in table on p. 144). The new prices are coming in slowly as individual warehouses take time to study the situation. In some cases, competition is forcing a reduction in the spread between mills and distributor prices on large quantity orders.

But, although squeezed, the distributors are generally reluctant to absorb any part of mill price increases. "We'll pass price increases by the mills on to our customers," says a West Coast warehouse official. "There's no place we can 'give' in absorbing increased prices. We're already service-minded and breaking our backs to do all we can on fast delivery and other aids to the buyer."

Mill Price Changes — Recent price increases include:

Electrical Alloys: Allegheny Ludlum Steel Corp., effective Aug. 15, increased base prices of some electrical alloy steels an average of less than 3 pct. Included were base prices of bars, sheets, strip, and wire products used in magnetic and electronic applications.

PURCHASING AGENT'S CHECKLIST

Forgings offer savings if you know when to use them. **P. 89**

Delivery problems slow up wire product imports. **P. 63**

Service to customers pays off for abrasives maker. **P. 62**

Mechanical Tubing: Babcock & Wilcox Co., effective Aug. 11, raised its prices an average of 3½ pct on seamless carbon and alloy mechanical and pressure tubing.

Export Prices: United States Steel Export Co., effective Aug. 12, increased its price on carbon, alloy, and high strength steel products. The advances, according to the company, average "a fraction below percentage increases made in domestic mill prices."

Cold-Rolled Strip: Philadelphia Steel and Wire Corp., effective Aug. 18, has raised price of its cold-rolled strip $3.50 a ton. New price is 7.875 cents per lb.

Merchant Wire: Other producers, including Sheffield Steel Div. of Armco Steel Corp. and Keystone Steel & Wire Co., have increased the price of annealed and galvanized merchant wire. (New prices are on p. 145.)

Ingot Rate Change — Due to elimination of 287,000 tons of capacity by American Steel & Wire Div., the Northeast steel producing district of The IRON AGE now represents less than ¼ of 1 pct of total industry capacity. For this reason, the Northeast district will no longer be tabulated.

Market Better—Meanwhile steel product sales continue making steady, but not spectacular gains. Here's the rundown by products:

Sheet and Strip: August and September mill bookings are above second quarter levels for many mills. Automotive tonnages are building up steadily in both months. Specialty sheets, especially aluminized, are in good demand.

Bar: Hot-rolled bar is showing gains, but cold-finished still lags with some mills on 3-4 day work weeks.

Plates and Shapes: Heavy plate sales are suffering from customer inventory cutting. Light plate is stronger. Structural mills report more buyers are coming back into the market. Both plate and structural producers expect a busy fourth quarter.

COMPARISON OF PRICES

(Effective Aug. 19, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Aug. 19 1958	Aug. 12 1958	July 22 1958	Aug. 20 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	4.925¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.05	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.60	6.60
Hot-rolled strip	5.10	5.10	4.925	4.925
Cold-rolled strip	7.425	7.425	7.17	7.17
Plate	5.32	5.32	5.12	5.12
Plates, wrought iron	13.55	13.55	13.15	13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) coke	$10.30	$10.30	$10.30	$10.30
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	9.00
Special coated mfg. ternes	9.55	9.55	9.55	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.425¢	5.425¢
Cold finished bar	7.65	7.65	7.30	7.30
Alloy bars	6.725	6.725	6.475	6.475
Structural shapes	5.50	5.50	5.275	5.275
Stainless bars (No.302)	45.00	45.00	45.00	45.00
Wrought iron bars	14.90	14.90	14.45	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	7.65¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.525
Light rails	6.50	6.50	6.50	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$77.50	$77.50
Slabs, rerolling	80.00	80.00	77.50	77.50
Forging billets	99.50	99.50	96.00	96.00
Alloy blooms, billets, slabs	119.00	119.00	114.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.15¢	6.15¢
Skelp	5.05	5.05	4.875	4.875
Finished Steel Composite: (per pound)				
Base price	6.188¢	6.188¢	5.967¢	5.967¢

	Aug. 19 1958	Aug. 12 1958	July 22 1958	Aug. 20 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.97	$70.97	$70.97	$70.35
Foundry, Valley	66.50	66.50	66.50	66.50
Foundry, Southern Cin'ti	73.87	73.87	73.87	70.67
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.47	70.47	70.47	69.88
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.49	$66.49	$66.49	$66.40
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$44.50	$44.50	$40.50	$55.50
No. 1 steel, Phila. area	37.50	37.50	34.50	51.50
No. 1 steel, Chicago	43.50	43.50	39.50	52.00
No. 1 bundles, Detroit	37.50	37.50	31.50	50.50
Low phos., Youngstown	46.50	46.00	41.50	57.50
No. 1 mach'y cast, Pittsburgh	51.50	51.50	48.50	58.50
No. 1 mach'y cast, Phila.	49.50	49.50	48.50	56.50
No. 1 mach'y cast, Chicago	53.50	52.50	48.50	53.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$41.83	$41.83	$38.17	$53.00
No. 2 bundles	29.50	29.83	27.17	46.17
Coke Connellsville: (per net ton at oven)				
Furnace coke, prompt	*$14.50*	$15.38	$15.38	$15.38
Foundry coke, prompt	*$18-18.50*	$17.50-$19	$17.50-$19	$17.50-$19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	26.50	26.50	26.50	28.50
Copper, Lake, Conn.	26.50	25.00	26.50	28.50
Tin, Straits, N. Y.	95.25†	95.25	96.125	94.50
Zinc, East St. Louis	10.00	10.00	10.00	10.00
Lead, St. Louis	10.80	10.80	10.80	13.80
Aluminum, virgin ingot	26.80	26.80	26.10	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Market Runs Out Of Momentum

There's more evidence that the market is running out of steam.

The trade is still determined to avoid a severe loss of pressure, but uncertainty grows.

▪ The market is hovering in a state of indecision. It would be premature to forecast a break, but some brisk buying for September will be necessary to sustain the present level.

Some price increases show up in scattered markets. However, they appear to be on the basis of built-up momentum, or a catching up with related markets, than from increased strong demand.

The major factor in preventing a sudden break is that, in most of the leading consuming areas, there is still no great abundance of scrap, particularly of premium or No. 1 openhearth grades.

Attempts to break the price levels again are meeting stronger resistance. The trade is still hopeful of increased buying in the near future and is not going to be pressured easily, at least while there is evidence of inventory building.

There are some significant signs of weakness: In Pittsburgh, the trade is willing to sell at current prices, but few buyers; Detroit dealers were frozen out this month; Export is considerably weaker.

In the face of the uncertain market, the No. 1 Composite Price held, but the No. 2 bundle price dipped 33¢.

Pittsburgh—Price of No. 1 heavy melting is unchanged. Secondary openhearth grades are off $1. The openhearth market is weaker in the sense that there are sellers at current prices but no new buyers. Recent orders are pretty well covered. No new tonnage business has developed but it has not been shown that No. 1 grades can be bought in quantity for less money. The market for stainless scrap is strong and active. Demand for turnings and cast grades is lagging.

Chicago—Broker attempts to buy scrap at reduced prices are running into a mild strengthening in dealer resistance. With September approaching, and the steel operating rate still going up, dealers are increasingly anxious to build up yard stocks. Cast, stainless, and railroad grades are being sought for inventory.

Philadelphia—Prices are unchanged here. Domestic demand is the strong factor in the market today while export business has faded away. It is a reversal of conditions that prevailed in the previous six months. Exporters are getting their scrap cheaper at other ports. Cast grades are moving steadily, but dealer bundles are a drug on the market.

New York — Steelmaking grades are holding in a temporarily quiet market. Brokers are still waiting for domestic orders while covering export sales. Quality is important, with some dealers receiving premiums for high grade material. Cast grades are up $1 on basis of pipe foundry buying.

Detroit—So far this month dealers have been frozen out of the market on primary steelmaking grades and, with industrial lists due to close next week, there is little likelihood of a thaw before early September.

Cleveland — Market is up $1 based on a sale of dealer material at $46 in the Valley. Price is edging up as mills continue to build inventory but find prime grades scarce. Foundry steel, however, showed a $1 setback on sale of 2-ft constructional at $48.

St. Louis—This market is steady at generally unchanged prices. Mills are drawing a steady flow of material in anticipation of increased operations. No. 1 railroad heavy melting, rerolling rails, and stove plate are off $2. Heavy breakable cast is up $1.

Birmingham—With no urgency on the part of mills to buy or dealers to sell, the market is about at a stalemate. A fairly large sale of industrial scrap was made at more than $2 above the market for bar crops and plate. Cast is active and advanced $1.

Cincinnati—Dealers are still willing to sell at present prices but activity has slowed to a walk, with most current orders filled. Upriver sales have dropped off and foundry market continues slow.

Buffalo — The market here continues inactive. Feeling here is that prices will be lower if a purchase is made next month. Dealers are shipping what little scrap they have coming in, keeping inventories steady.

Boston — This market is quiet. With the exception of some foundry buying, there is little activity on the domestic scene. Yard cast and No. 1 machinery cast are up $1.

West Coast—A few major dealers report a slight increase in scrap coming into their yards. But the supply is still tight. Several cargoes are being loaded for Japan. Prices are unchanged.

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SCRAP PRICES *(Effective Aug. 19, 1958)*

Pittsburgh

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	50.00 to 51.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and ms. turn.	20.00 to 21.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch'gs plate	49.00 to 50.00
Heavy turnings	25.00 to 36.00
No. 1 RR hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	57.00 to 58.00
RR steel wheels	52.00 to 53.00
RR spring steel	52.00 to 53.00
RR couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	41.00 to 42.00
Stainless	
18-8 bundles and solids	200.00 to 210.00
18-8 turnings	120.00
430 bundles and solids	110.00 to 115.00
410 turnings	50.00 to 60.00

Chicago

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	51.00 to 52.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Low phos. forge crops	53.00 to 54.00
Low phos. punch'gs plate	49.00 to 50.00
Low phos. 3 ft and under	47.00 to 48.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	54.00 to 55.00
Rerolling rails	64.00 to 65.00
Rails 2 ft and under	59.00 to 60.00
Locomotive tires cut	54.00 to 55.00
Cut bolsters & side frames	51.00 to 52.00
Angles and splice bars	56.00 to 57.00
RR steel car axles	70.00 to 71.00
RR couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	53.00 to 54.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	41.00 to 42.00
Cast iron brake shoes	43.00 to 44.00
Cast iron wheels	40.00 to 41.00
Malleable	57.00 to 58.00
Stove plate	44.00 to 45.00
Steel car wheels	51.00 to 52.00
Stainless	
18-8 bundles and solids	195.00 to 200.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	105.00 to 110.00
430 turnings	65.00 to 70.00

Philadelphia Area

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	19.00 to 20.00
Mixed bor. short turn.	18.00 to 19.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	22.00 to 23.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	40.00 to 41.00
Low phos. 2 ft and under	42.00 to 43.00
Low phos. punch'gs	42.00 to 43.00
Elec. furnace bundles	38.00 to 39.00
Heavy turnings	32.00 to 33.00
RR steel wheels	44.50 to 45.50
RR spring steel	44.50 to 45.50
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	44.00 to 45.00
Malleable	56.00 to 57.00
Unstripped motor blocks	30.00 to 31.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 dealer bundles	38.50 to 39.50
No. 2 bundles	26.00 to 27.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	17.00 to 18.00
Low phos. 18 in. and under	43.00 to 44.00
Rails, random length	44.00 to 45.00
Rails, 18 in. and under	54.00 to 55.00
No. 1 cupola cast.	42.00 to 43.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	46.00 to 47.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	$41.50 to $42.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 dealer bundles	41.50 to 42.50
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	28.50 to 29.50
No. 1 busheling	41.50 to 42.50
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Cut structural & plates, 2 ft & under	47.00 to 48.00
Drop forge flashings	41.50 to 42.50
Low phos. punch'gs plate	42.50 to 43.50
Foundry steel, 2 ft & under	41.00 to 42.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Railroad grate bars	18.00 to 19.00
Steel axle turnings	25.00 to 26.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	44.00 to 45.00
Malleable	61.00 to 62.00
Stainless	
18-8 bundles	195.00 to 200.00
18-8 turnings	105.00 to 110.00
430 bundles	100.00 to 105.00
430 turnings	40.00 to 45.00

Buffalo

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	16.00 to 17.00
Low phos. plate	40.00 to 41.00
Structurals and plate, 2 ft and under	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	59.00 to 60.00
RR steel wheels	44.00 to 45.00
RR spring steel	44.00 to 45.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	39.00 to 40.00

St. Louis

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	30.00 to 31.00
Machine shop turn.	17.00 to 18.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails, random lengths	48.00 to 49.00
Rails, 18 in. and under	54.00 to 55.00
Angles and splice bars	46.00 to 47.00
Std. steel car axles	65.00 to 66.00
RR specialties	47.00 to 48.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	39.00 to 40.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	43.00 to 44.00
Cast iron car wheels	40.00 to 41.00
Rerolling rails	60.00 to 61.00
Unstripped motor blocks	39.00 to 40.00

Birmingham

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	39.00 to 40.00
Elec. furnace, 2 ft & under	37.00 to 38.00
Bar crops and plate	46.00 to 47.00
Structural and plate, 2 ft.	45.00 to 46.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	45.00 to 46.00
Rails, 18 in. and under	51.00 to 52.00
Angles & splice bars	47.00 to 48.00
Rerolling rails	59.00 to 60.00
No. 1 cupola cast.	54.00 to 55.00
Stove plate	54.00 to 55.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	41.00 to 42.00

Youngstown

No. 1 hvy melting	$45.00 to $46.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	45.00 to 46.00
No. 2 bundles	31.00 to 32.00
Machine shop turn.	20.50 to 21.50
Shoveling turnings	24.50 to 25.50
Cast iron borings	24.50 to 25.50
Low phos. plate	46.00 to 47.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	17.00 to 18.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	24.00 to 25.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	35.00 to 36.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	34.00 to 35.00
Unstripped motor blocks	24.00 to 25.00
Stainless	
18-8 prepared solids	170.00 to 175.00
18-8 turnings	70.00 to 75.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	36.00 to 37.00
Drop forge flashings	33.00 to 34.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Low phos. punch'gs plate	34.00 to 35.00
No. 1 cupola cast.	39.00 to 40.00
Heavy breakable cast.	30.00 to 31.00
Mixed cupola cast.	39.00 to 40.00
Automotive cast.	43.00 to 44.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	90.00 to 95.00
430 bundles and solids	95.00 to 100.00
410 turnings	20.00 to 25.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 25.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	24.00 to 25.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and short turn.	8.00 to 9.00
Shoveling turnings	9.00 to 10.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	32.00 to 33.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	28.00 to 29.00
Stove plate	28.00 to 29.00
Unstripped motor blocks	22.00 to 23.00

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast.	45.00

Los Angeles

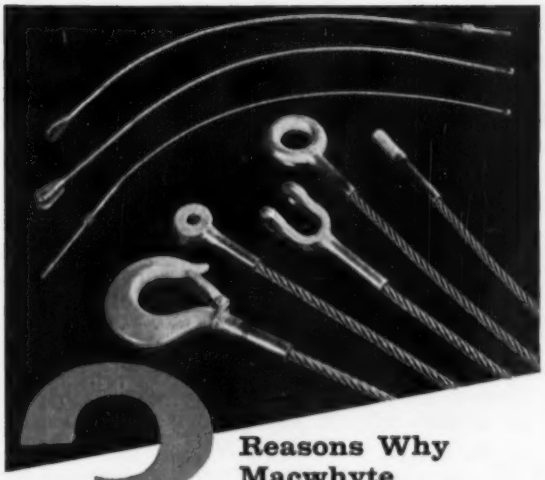
No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	$27.00 to 28.00
No. 2 bundles	17.00
Machine shop turn.	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Elec. furn 1 ft and under (foundry)	43.00
No. 1 RR hvy. melting	33.00
No. 1 cupola cast.	39.00 to 41.00

Seattle

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	26.00
No. 1 dealer bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Busheling	30.00
Bush., new fact., prep'd.	30.00
Bush., new fact., unprep'd	24.00
Machine shop turn.	15.00
Short steel turn.	19.00
Mixed bor. and turn.	15.00
Rails, rerolling	39.00
Cast scrap	$45.00 to 50.00



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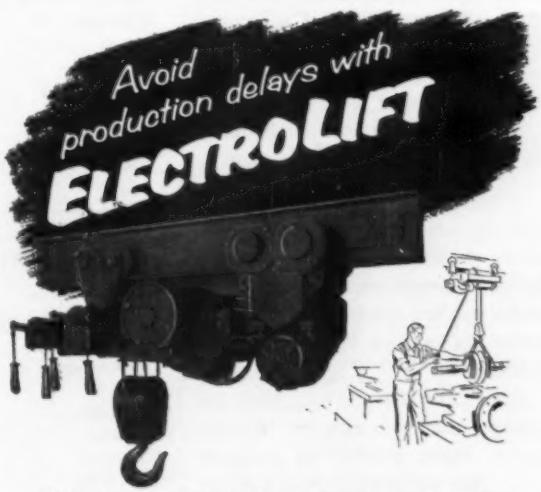

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Lead-Zinc Producers Still Hopeful

U. S. lead-zinc miners say Domestic Minerals Stabilization Bill still has a fighting chance.

But they are peering into a future without subsidies, just in case.

▪ Washington held most—but not quite all—of the attentions of the domestic lead and zinc industry this week.

The Domestic Minerals Stabilization Bill, which would bolster the domestic industry with subsidies, appeared to have a fighting chance, as Congress began its last week before adjourning. But also in the wind is a compromise. The Interior Dept. would get the right to borrow money to run the program for a year, but subject to review by the appropriate Congressional committee, under the compromise plan.

What Next? — But the domestic industry, almost from force of habit, having lost so many other battles for government recognition of their problems, has already begun to appraise the outlook if the bill is defeated.

Consensus: On the long haul, the stronger domestic may not fare too badly. More production cutbacks and other economies will have to be made. This could put operators of some smaller, marginal mines out of business. But limiting the supply would tend to take the pressure off prices, possibly help the lower cost mines that hold on compete more readily with imports.

Lead Price Off — One expected source of some optimism last week faded to a question mark this week. Several producers had noted improvement in sales in July, continuing into August. Then a major smelter led a ¼¢ per lb drop in the price of lead, and the market braked somewhat. Some consumers who had started some slight inventory rebuilding changed their minds and decided to wait for the decision on the subsidies bill.

Magnesium

The Magnesium Assn. reports shipments of wrought products in June reached the highest level since June 1957. The 855 tons shipped easily topped the previous month's 722 tons.

Copper

There were no real surprises in the latest Copper Institute report. Deliveries to U. S. fabricators in July hit a yearly low of 77,523 short tons. But this was expected, since July is the traditional vacation month for most fabricators.

A happy note: For the second month in a row, stocks at refineries were reduced, down 2669 tons from the end of June.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum ingot	26.80	26.10	8/1/58
Copper (E)	29.50	29-29.50	7/17/58
Copper (CS)	29.50	27.00	8/6/58
Copper (L)	29.50	29.00	7/17/58
Lead, St. L.	10.55	10.80	8/13/58
Lead, N. Y.	10.75	10.75	8/13/58
Magnesium ingot	36.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/56
Titanium sponge	185-205	200-250	4/1/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.80	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see right; other primary prices, pg. 139.

Aluminum Price Clarification

The reduction in the price of soft extrusions by Alcoa does not apply to alloy 6063, as reported in The IRON AGE, Aug. 14.

The list prices of 6061 and 6062 alloy extrusions were brought down "due to the competitive situation." But, 6063 alloy extrusions were increased 7/10¢ per lb, "reflecting the increased cost of basic material."

The new 6063 alloy extrusion prices are still 2¢ to 11¢ per lb lower than the prices of a year ago. Extrusions of alloys 6061 and 6062 were also raised at that time.

On Jan. 1 of this year, says Alcoa, list prices for 6062-T6 extrusions ranged from 60.2¢ to 76.8¢ per lb, and for 6063-T5 from 44.8¢ to 49.5¢ per lb, factor 1-26. But Alcoa also says these quotations were almost impossible to adhere to. Sharp competition for limited business caused almost universal discounting.

On April 1, 6061 and 6062 alloy extrusions were brought down, in line with a 2¢ reduction in the price of primary metal. On June 10, Alcoa 6063 list prices were lowered. They were increased again Aug. 1.

Some extruders have gone along with Alcoa raising their 6063 prices. But others say they have enough metal in their pipelines so they will not feel the increased cost of primary metal for 60 days. And they say they won't raise any of their prices until then.

Tin prices for the week: Aug. 13—94.50; Aug. 14—94.25; Aug. 15—94.125; Aug. 18—94.125; Aug. 19—94.00.*

* Estimate.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet (Mill Finish and Plate)
("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	48.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size*	¼	⅜-½	⅝-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.3
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.3

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	103	133
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Chot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	49.63	.....	46.86	49.82
Brass, 70/30	43.57	44.11	43.81	46.48
Brass, Low	46.03	46.57	45.97	48.84
Brass, R L	46.89	47.43	46.83	49.70
Brass, Naval	47.83	.....	42.14	51.24
Munts Metal	45.95	.....	41.76	.....
Comm. Bs.	48.30	48.84	48.24	50.86
Mang. Bz.	51.37	.....	45.67	.....
Phos. Bz. 5%	68.59	.....	69.09	.....

Free Cutting Brass Rod 29.28

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $8.50-$10.10; alloy, $15.95; Plate, HR, commercially pure, $6.00-$6.75; alloy, $8.75-$9.50. Wire, rolled and/or drawn, commercially pure, $6.50-$7.00; alloy, $10.00-$11.50; Bar, HR or forged, commercially pure, $5.25-$5.50; alloy, $5.25-$6.35; billets, HR, commercially pure, $4.10-$4.35; alloy, $4.10-$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex. . 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.55
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb)... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 50.00
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ... $70 to $80
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb. .. 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $239 to $243
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz... $17 to $19
Platinum, dollars per troy oz... $59 to $65
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 88.625
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 27.00
No. 120 ..... 26.25
No. 123 ..... 25.75
80-10-10 ingot
No. 305 ..... 31.25
No. 315 ..... 29.25
88-10-2 ingot
No. 210 ..... 38.25
No. 215 ..... 34.00
No. 245 ..... 30.75
Yellow ingot
No. 405 ..... 22.75
Manganese bronze
No. 421 ..... 24.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.50-25.00
0.60 copper max. 24.25-24.75
Piston alloys (No. 122 type)... 24.25-25.25
No. 12 alum. (No. 2 grade)... 21.50-22.00
108 alloy 22.00-22.50
195 alloy 25.00-26.00
13 alloy (0.60 copper max.)... 24.25-24.75
AXS-679 (1 pct zinc) 21.75-22.25

(Effective Aug. 18, 1958)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 22.50-23.50
Grade 2—92-95% 21.25-22.25
Grade 3—90-92% 20.25-21.25
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	22½	21¾
Yellow brass	17	16¼
Red brass	19¾	19
Comm. bronze	20⅛	19⅞
Mang. bronze	15⅞	14⅞
Yellow brass rod ends	16¾	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 22¾
No. 2 copper wire 21¼
Light copper 19
*Refinery brass 20¾
Copper bearing material 19
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 22¾
No. 2 copper wire 21¼
Light copper 19
No. 1 composition 19⅛
No. 1 comp. turnings 18¾
Hvy. yellow brass solids 14
Brass pipe 15
Radiators 15½

Aluminum

Mixed old cast. ..... 12 —12½
Mixed new clips ..... 15 —16
Mixed turnings, dry ..... 13 —14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 19¾—20¼
No. 2 copper wire ..... 17¾—18¼
Light copper ..... 15¾—16¼
Auto radiators (unsweated). 11¾—12¼
No. 1 composition ..... 15¾—16¼
No. 1 composition turnings.. 14¾—15¼
Cocks and faucets ..... 13 —13¼
Clean heavy yellow brass ... 11 —11½
Brass pipe ..... 13 —13½
New soft brass clippings .... 13½—14
No. 1 brass rod turnings .... 11 —11½

Aluminum

Alum. pistons and struts .... 5 — 5½
Aluminum crankcases ..... 9 — 9½
1100 (2S) aluminum clippings 12½—13
Old sheet and utensils ..... 9 — 9½
Borings and turnings ..... 6 — 6½
Industrial castings ..... 9 — 9½
2024 (24S) clippings ..... 10½—11

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1⅞— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed 18
Nickel silver turnings, mixed 15

Lead

Soft scrap lead ..... 6¾— 7
Battery plates (dry) ..... 2½— 2½
Batteries, acid free ..... 1½— 1¾

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixer common babbitt ..... 9½—10
Solder joints ..... 13½—13¾
Siphon tops 42
Small foundry type ..... 10½—10¾
Monotype ..... 10¼—10½
Linc. and stereotype ..... 9¼— 9½
Electrotype ..... 8½— 8½
Hand picked type shells .... 6¼— 6¾
Linc. and stereo. dross ..... 2¼— 2½
Electro dross ..... 1¾— 2

STEEL

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B3*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*					
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.90 *G4*		15.50 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P18*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8 M8*			8.40 *W8, S9,I3*	15.55 *A1, S9,G4*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, D1,D2,P11*	7.575 *G3*	10.80 *D2*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*			5.20 *N4*					
	Indianapolis, Ind.									7.575 *J3*				15.70 *J3*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *S1* 10.75 *R3*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W3,F3*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*			7.425 *Y1,J3*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *J3, Y1*
WEST	Fontana, Cal.	$90.50 *K8*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.85 *K1*	9.275 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*		5.35 *S2*		7.825 *S2*		8.35 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.325 *J3* 9.475 *C1*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$113.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2* R3, C16	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*		5.35 *S2*		7.825 *S2*		8.35 *S2*	

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STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras applv.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box prices. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.775 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*,	10.025 *B3*	6.50 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*								
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		6.775 *R3*		7.525 *R3, J3*	9.275 *R3 J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A1*	6.275 *A1*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*	6.875 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio		6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, N3, S1*	6.275 *R3*	6.875 *R3*	6.775 *N3, S1*	7.225 *N3, S1**, *R3*	7.525 *R3, S1*	9.275 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1,*	6.40 *A5, J3, P6*	$10.05 *W5, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W3*	6.875 *W3, W3*		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*		6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.85 *K1*	7.525 *K1*				8.275 *K1*	10.575 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$10.80 *C7*	$9.50 *C7*	
SOUTH	Atlanta, Ga												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.65 *S2*			

(Effective Aug. 18, 1958)

*7.425 at Sharon-Niles is 7.225.

STEEL PRICES

Italics identify **producers** listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.475 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, N. J. Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*		
	Canton, Massillon, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3,* 6.475*T5*	9.025 *R3,R2,* 8.775 *T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.40 *R3,J3 E2*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.775 *G3*	6.025 *G3*	7.90 *P3* 7.85 *P8,B5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.175 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,S1*	9.025 *C10*	7.925 *S1*	5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1, J3*	6.375 *U1*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5 J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1, R3,Y1*	8.00 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		8.625 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.175 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	8.625 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				8.675 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6*	6.425 *B2*				8.675 *B2*	6.20 *B2*		8.46 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.875 *A8*									8.80 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2, R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.925 *S2*	5.925 *S2*		6.975 *S2]*		8.175 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Aug. 18, 1958) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Lackede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING — **Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.78	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Aug. 18, 1958)

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over ..... 10.5¢
F.O.B. Riverton or Camden, New Jersey, west of Miss. River .... 9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River ..... 10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River ..... 9.5¢
Canadian sponge iron, del'd in East, carloads ..... 10.5¢
Atomized iron powder, 98% + Fe, 40 mesh,, F.O.B. Easton, Pa., in 100 lb bags ..... 7.7¢
Atomized iron powder, 98% + Fe, F.O.B. Easton, Pa., in 100 lb bags—RZ-365—Freight allowed east of Miss. River ..... 10.5¢
Atomized iron powder, 98% + Fe. Cutting and scarfing grade, F.O.B. Easton, Pa. ..... 8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe .... 29.5¢
200 mesh ..... 33.0¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe 57.0¢
Electrolytic iron melting stock, 99.84% pure ..... 27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe.. 88.0¢ to $2.85
Aluminum, freight allowed.. 38.00¢
Brass, 10 ton lots ..... 31.1¢ to 47.1¢
Copper, electrolytic ..... 41.50¢
Copper, reduced ..... 40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd $5.00
Lead, f.o.b. Hammond, Ind. . 19¢
Manganese f.o.b. Extron, Pa. 46.0¢
Molybdenum, 99% ..... $3.60 to $3.95
Nickel, chemically precipitated $1.05
Nickel, unannealed $1.00
Nickel, annealed $1.06
Nickel, spherical, unannealed #80 ..... $1.13
Silicon ..... 43.50¢
Solder powder .....13¢ plus met. value
Stainless steel, 302 ..... $1.02
Stainless steel, 316 ..... $1.30
Tin .....14.00¢ plus metal value
Tungsten, 99% (65 mesh) $3.15 (nominal)
Zinc, 5000 lb & over.....17.5¢ to 30.7¢

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
	Pct. Discounts			
½" and smaller x 6" and shorter	40	54	56	57
5/8" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	40	54	56	57
Lag, all diam. x 6" & shorter	40	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	40	54	56	57

(Add 25 pct for broken case quantities)

	Full case or Keg price
Nuts, Hex, HP reg. & hvy.	
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅞ in. and smaller	63
Rivets	*Base per 100 lb*
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws *Discount (Packages)*

	Full Finished	H. C. Heat Treat
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Plain Finish Cartons	60	60
Bulk *Quantity*		
To ⅛" diam. incl. 25,000-and over	60	..
5/16 to ⅛" diam. incl. 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
⅝" diam. & smaller 25,000 and over	14	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper
Rolled elliptical, 18 in. or longer, 5000 lb lots 40.00
Electrodeposited 32.75
Brass, 80-20, ball anodes, 2000 lb or more 45.50
Zinc, ball anodes, 2000 lb lots 16.50
(for elliptical add 1¢ per lb)
Nickel, 99 pct plus, rolled carbon, 5000 lb .....1.02[25]
(Rolled depolarized add 3¢ per lb)
Cadmium 1.55
Tin, ball anodes $1.13 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum 68.70
Copper sulphate, 100 lb bags, per cwt. 22.15
Nickel salts, single, 100 lb bags.... 36.00
Nickel chloride, freight allowed, 300 lb 42.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums 24.05
(Philadelphia price 24.50)
Zinc cyanide, 100 lb 60.75
Potassium cyanide, 100 lb drum N. Y. 48.00
Chromic acid, flake type, 10,000 lb or more 30.44

CAST IRON WATER PIPE INDEX

Birmingham 125.8
New York 138.7
Chicago 140.9
San Francisco-L. A. 148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (10 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.10	9.00	9.78	8.80	8.76	8.60	8.75	12.43	16.28	15.28	19.83	19.08
Birmingham		8.18	9.45	10.46	8.23	8.56	8.64	8.60	10.56*	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.28*	16.38	15.38	19.93	19.18
Buffalo	.15	8.40	9.15	11.22	8.90	9.35	9.40	9.30	11.15*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.25	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	.15	8.49	9.65	10.60	8.98	9.42	9.71	9.46	9.46	16.52	15.52	20.02	19.27
Cleveland	.15	8.33	9.60	10.35	8.78	9.28	9.54	9.25	11.95*	16.34	15.31	19.81	19.06
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit	.15	8.58	9.85	10.60	9.03	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.23
Houston		8.10	8.60	.....	8.15	8.45	8.05	8.10	11.10	16.20	15.25	19.65	18.95
Kansas City	.20	9.02	10.27	10.82	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.25	10.30	12.10	8.90	8.85	8.70	8.75	12.10*	17.05	16.10	21.05	20.35	.....
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.38	8.80	9.18	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	.10	8.97	10.23	10.66	9.74	9.87	9.84	10.09	13.31*	16.19	15.19	19.74	18.99
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	10.02	8.79	8.87	8.68	8.75	11.61*	16.11	15.11	19.66	18.91
Pittsburgh	.15	8.60	9.95	11.05	8.76	9.05	9.15	9.14	11.40*	16.20	15.20	19.70	18.95
Portland		10.00[1]	11.75[2]	13.30[3]	11.95[4]	11.50[5]	11.10[6]	9.85[7]	16.00	18.50	17.45	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.20	10.00	9.70	9.80	10.10	14.05	17.15	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.61	9.04	9.42	9.63	9.52	9.93	16.58	15.58	20.08	19.33
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81	.....	15.41	.....	19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage. †† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds. [1] 10 ga. x 36" x 120"; [2] 20 ga. x 36" x 120"; [3] 26 ga. x 30" x 96"; [4] ⅛" x 1" in lots of 1000 to 9999; [5] sheared plate ¼" x 84" in lots of 1000 to 9999; [6] 8" x 5.70" in lots of 1000 to 9999; [7] M-1020—1-in. rounds in lots of 1000 to 9999.

(Effective Aug. 18, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2

High-carbon chromium .. .955 D-3, D-5
Oil hardened manganese .505 O-2
Special carbon ..... .38 W-1
Extra carbon ..... .38 W-1
Regular carbon ..... .325 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	Plate (*A3, J2, L4, C4*) 15 pct	Plate (*A3, J2, L4, C4*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	S. $25	6.50	6.975	.....	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	.....	14.75
So. Chicago *R3*	.....	.....	.....	10 10	.....	.....	.....
Ensley *T2*	S. $25	6.50	.....	.....	.....	.....	.....
Fairfield *T2*	.....	6.50	.....	10 10	.....	6.60	.....
Gary *U1*	S. $25	.....	.....	.....	.....	6.60	.....
Huntington *C16*	.....	6.50	.....	.....	.....	.....	.....
Ind. Harbor *I3*	S. $25	.....	6.975	10 10	.....	6.60	.....
Ind. Harbor *Y1*	.....	.....	.....	10 10	.....	.....	.....
Johnstown *B3*	.....	6.50	.....	.....	.....	.....	.....
Joliet *U1*	.....	.....	6.975	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10 10	.....	.....	14.75
Lackawanna *B3*	S. $25	6.50	6.975	.....	.....	6.60	.....
Lebanon *B3*	.....	.....	6.975	.....	14.50	.....	14.75
Minnequa *C6*	S. $25	7.00	6.975	10 10	.....	6.60	14.75
Pittsburgh *P5*	.....	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	10 10	.....	.....	.....
Seattle *B2*	.....	.....	.....	.....	.....	6.75	15.75
Steelton *B3*	S. $25	.....	6.975	.....	.....	6.60	.....
Struthers *Y1*	.....	.....	.....	10 10	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.50	.....	.....	.....	.....	.....
Youngstown *R5*	.....	.....	.....	10 10	.....	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.50
Foundry, beehive (f.o.b.)	$18.00 to $18.50
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	.....	9 875
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	.....	.....
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	48	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	68.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Aug. 18, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	17½" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R5*	173	187	...	212	193	8.65	9.20
Aliquippa *J3***	173	190	...	...	190	8.65	9.325
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775**
Buffalo *W6*	.....	.....	.....	.....	.....	8.65	8.95*
Chicago *N4****	173	190	172	212	196	8.65	9.325
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	192	...	214	198	8.75	9.425
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.00	9.675
Johnstown *B3***	173	190	172	...	196**	8.65	9.325**
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	8.75	9.30*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.60	10.275
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6†*	178	192	177	217	198†	8.90	9.45†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.20
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	8.95	9.50*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6†*	.....	.....	.....	236	...	9.60	10.15†
Sparrows Pt. *B3***	175	.....	...	214	198	8.75	9.425
Sterling, Ill. *N4****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.30
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7.8*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	.....
	2½	12	48.94	57.31	.....
	3	12	56.51	66.18	.....
	3½	11	65.97	77.25	.....
	4	10	87.61	102.59	.....

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*			.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	39.25	40.00	41.25	42.25	50.00	45.75	71.75	54.75	64.75	30.00	30.00	36.75	31.00
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50-52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2* Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*, Bridgeville, Pa., *U2*; Detroit, *M2*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *J3*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*, Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1* Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A5*; Massillon, O., *R5*, S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owenboro, Ky., *G5*; Bridgeport, Conn., *N8*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*, Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R5*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*.

(Effective Aug. 18, 1958)

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BLAST CLEANING EQUIPMENT

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HIGH-SPEED

"Rapid-Blast"

MACLEOD

Blast Cleaning Cabinet

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The Brand New Type AL "Rapid-Blast" Cabinet is specifically designed for high rate of continuous automatic production. Also a complete line of rooms, machines and dust arresters. Over 60 years experience designing and building special equipment. Write for descriptive literature on MACLEOD Blast Cleaning Rooms, Cabinets, and Machines.

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Four, Five, Six, Eight Spindles • Work and Tool Rotating Type

GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
0.10% C, 52-57% Cr, 2.00% max Si. 37.50
7-8½% max C, 50-55% Cr, 3-6% max Si 22.50
7-8½% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads (Bulk)	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Packed, pallets, 3000 lb up to carloads	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.20	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
	90% Si....	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots .....|	$2.05	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective Aug. 18, 1958)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	10.35¢
Ton lots	11.70¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.00
Less ton lots.....	4.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $3.80

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 ..... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	$1.46
Less ton lots (packed) ...	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

ELECTRICAL POWER EQUIPMENT IN STOCK

DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	New Elliott	Enc. F.V.	475	320
1	3000	New Whse.	Enc. F.V.	625	600
1	2250	New Elliott	Enc. F.V.	600	300/360
1	2200	G.E.	MCF	600	400/500
1	1750	New Elliott	Enc. F.V.	250	175/350
8	1500	New Whse.	Enc. F.V.	525	600
1	1375	G.E.	MCF	415	1300
1	1300	G.E.	MCF-13	300	200/450
1	1200	G.E.	MCF	600	450/600
1	1000	Whse.		500	300/2900
1	940	Whse.	QM	250	140/170
2	940	S.S.	Enc. F.V.	600	800/1000
2	800	G.E.	MCF	250	400/750
2	750	G.E.	MCF	600	450/900
1	750	G.E.	MCF	600	300/750
1	750	G.E.	MCF	600	120/300
2	645	S.S.	Enc. F.V.	300	1000
4	600	Whse.		250	275/550
1	500	G.E. B.B.	TLF-2656H	250	2000/3600
1	500	G.E.	MPC-10	250	188/400
3	450	Whse.		550	415
2	400	G.E.	CY-275	300	1000/1500
1	300	Cr.Wh.	K-192 B.B.	230	1200
2	300	G.E.	MPC	230	400
2	275	G.E. B.B.	TLC-108	250	2000/4000
1	225	G.E. B.B.		250	1150/3600
1	200	Rel. B.B.	T-663-D.P.	240	1150
1	200	Rel. B.B.	T-664-D.P.	240	850
1	200	Whse.	CB-207.4	250	850/1200
1	150	Cr.Wh.	CMC-65H	230	1150
1	150	G.E. B.B.	TLC-74	250	1150/3500
1	150	Rel. B.B.	T-663-D.P.	240	850/1700
1	150	G.E. B.B.	CD	600	250/750
1	120	G.E. B.B.	TLC-50	250	1950/5000
1	125/150	New Whse.	CB-210.3	230	300/1200
1	120	Rel. B.B.	1050T	230	575/900
2	125	Whse.	SK-190	230	450/1200
1	125	Whse.	SK-185	230	350/1050
1	100	G.E.	CDP-115	230	1750
2	100	Whse.	SK-181	230	450/1000
1	75	Rel. B.B.	T-663 D.P.	240	500/1000
1	75	G.E. B.B.	CD-1235-D.P.	600	850
1	60/75	Rel. B.B.	T-664-D.P.	240	300/1200
1	40	Rel. B.B.	TY 662	240	500/1500
1	25/33	Rel. B.B.	TY 543	240	300/1200
2	60	Rel. B.B.	T-406-D.P.	240	1750/3400
1	50	Rel. B.B.	T-405-D.P.	240	1750
1	40	Rel. B.B.	T-405-D.P.	240	1750
6	40	Rel. B.B.	995F. TEFC	230	500/1500
1	30/40	Rel. B.B.	T-564-D.P.	240	300/900

MERCURY ARC RECTIFIERS

3—150 KW, G.E., Sealed Tube Ignitron Unit Substation load centers 275 V. D.C., 2300 V. A.C. Pyranol filled transformers complete.
2—150 KW, G.E., Ignitron, 245 V. D.C.—230 V. A.C., air cooled transformers with controls.

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	1750	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	600	600	11000/6600
1	1500	S.S. 8 unit	720	600	11000/6600
1	1300	Cr.Wh. 4 unit	720	100	2300
2	1000	G.E.	720	600	4600/13200
2	750	G.E.	720	250/300	4600/13200
1	500	G.E.	900	125/250	440
1	350	G.E.	900	125	440/2300/4160
1	300	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2300
1	240	Whse.	900	125	220/440
1	200	G.E.	1200	250	440/550
1	200	Whse.	1200	550	2300
1	200	Ft Mby.	1200	250	2300/4000
1	150	G.E.	1200	275	2300
1	150	Whse.	1200	275	2300
1	150	G.E.	1200	125	440
1	140	Cr.Wh.	600	125/250	2300
1	125	G.E.	1800	250	220/440
1	100	G.E.	1170	250	220/440
1	100	Cr.Wh.	1800	240	440
2	100	Cr.Wh.	1160	525	220/550
1	100	G.E.	1200	250	2400/4100
2	75	Whse.	1200	125	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
2	3333	Whse.	OISC	1	13800 x 2300
1	1500	G.E. auto	HT	3	4800/4300/4400
3	1000	G.E.	OA/FA	1	13800 x 230/460
2	750	G.E.	Pyranol	1	4800x85/55-255/165
3	500	Kuhl	OISC	1	13200 x 6600
3	333	G.E.	BS-W4R	1	2400/4160 240 x 480
3	333	G.E.	OISC	3	2400/4160Y x 600
3	150	G.E.	OISC	1	22000x2300/4000Y
3	100	Whse.	SK	1	4600x460/230/115

CRANE & MILL MOTORS

230 V., D.C.

Qu.	H.P.	Make	RPM	Type
14	12/15	Whse.	700/800	MCA-30, Series
1	20	Whse.	975	K-5, Series
2	23	G.E.	650	MDS-408
2	25	G.E.	725	CO-1808, Series
1	35	Whse.	480	CR-9 Comp. S.B.
1	35	Whse.	440	CR-9 Sh. S.B.
1	45	Whse.	800	CR-9 Comp. S.B.
3	50	G.E.	650	COM-1830 Comp.
3	50	Whse.	525	CR-9 Shunt R.B.
2	50	Whse.	600	CR-9 Comp. R.B.
1	50	G.E.	525	COM-1830AE B.B.
1	50	Cr.Wh.	550	SW-50 Comp.
1	100	G.E.	475	CO-1832 S.B.
6	100/140	Whse.	500/415	MC-90 R.B.

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Long Pending Sales Closed at New York

Used machinery dealers there say some customers are finally taking the buying plunge.

But gains are spotty, with heavy equipment in the strongest demand.

▪ Midsummer used and rebuilt machinery sales in the New York area are coasting along at an unspectacular level. But some dealers see coming gains, believe a sales upturn is close.

Overall, the word for business in the area is spotty. Volume of orders for metalworking plants is in many cases just too low to justify equipment buying. For these companies, even replacement purchasing requires major thought.

Stocks of tools in dealers' hands are plentiful, and prices appear to have stabilized for the time being.

Some Gains Reported—But some dealers report sales have spurted in the last two or three weeks as customers see their order backlogs rising. In several cases these sales are the end of negotiations that started months ago. And there is little haggling over price. Sales are either a go or no-go matter in most cases.

Heavy Items Popular — Buying emphasis is on heavy equipment. One dealer reports a very good price last week for a 36-ft boring mill, and adds he sold a 1500-ton extrusion press virtually over the telephone. "The customer needed it," he says. "I had it, and that's about all there was too it."

Not all lines have been so fortunate. A leading electrical equipment dealer reports his July business very slack, with little sign of upturn as yet. Big trouble, he finds, is buyer reluctance to part with cash. Several buyers have been all set, then found their own financial people had turned down the purchase. But there's no doubt a real demand exists for equipment, and a continued pickup in general business should loosen purse strings.

Price Rises? — Although prices are firm, there is a good chance of a rise in the near future. A recent large sale of heavy tools by the Navy brought unexpectedly good prices, and a coming sale of $4 million worth of tools from Curtiss-Wright is expected to bring at least equally good prices.

Present customers continue to show a strong preference for late-model tools in good condition. Buyers are simply not interested in early equipment at any price. And in most cases the demand is for heavy-duty machines. Construction activity continues to fire a strong need for construction equipment of all types, including ironworkers, shears, and press brakes.

June Sales Improved, MDNA Reports

June sales of used machine tools were 12.4 pct over May levels, according to the Machinery Dealers National Association. During that month the number of tools sold also increased 5.2 pct over May. Association officials see these advances a sign of industry's confidence, reflecting machine tool buying to meet greater production needs.

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLL
Thomas #3 Horiz. Angle Bending Roll 4 x 4 x ⅝"

BENDING ROLLS
8' x ¼" Bertsch Initial Type
12' x 5/16" Bertsch Initial Type
12' x ⅝" Hilles & Jones Pyramid Type
12' x 3/16" Bertsch Initial Type—NEW
32' x ⅜" Baldwin Pyramid Type

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span 220/3/60
5 ton Shepard Niles	70' Span 230 Volt D.C.
7½ ton Shaw	40' Span 230 Volt D.C.
8 ton P&H	55' Span 220/3/60
10 ton P&H	39' Span 230 Volt D.C.
10 ton Milwaukee	57' Span 220 Volt D.C.
10 ton Shaw	48' Span 230 Volt D.C.
10/3 ton P&H	47' Span 220/3/60 A.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Northern	54' Span 230 Volt D.C.
15 ton Shepard Niles	56' Span 230 Volt D.C.
20/5 ton Whiting	47' Span 220/3/60 A.C.
120 ton Shepard Niles	77' Span 220/3/60

DRAW BENCHES
3000 lb. Draw Bench, 20 ft. Pull
7000 lb. Draw Bench, 50 ft. Pull—New 1956
10,000 lb. Draw Bench, 50 ft. Draw—LATE

FORGING MACHINES
1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING 800 lb. to 12,000 lb. incl.

LEVELLERS—ROLLER
37" Torrington, 19 Rolls 1 21/32" dia.
44" Newboldt, 9 Rolls 4 dia.
60" Aetna Standard, 17 Rolls 4⅝" dia.
72" McKay, 15 Rolls 4¼" dia.

PRESSES—HYDRAULIC
500 ton Watson Stillman Piercing Press 48" x 72"
500 ton HPM Fastraverse, Bed 36" x 36"
600 ton Elmes 36" Stroke, 48" x 45" Bet. Cols.
1000 ton HPM Fastraverse, Bed 48" x 72", 36" Stroke
1500 ton Mesta Steam Hydr. Forging Press

PRESSES—STRAIGHT SIDE
190 ton Toledo #57½, 10" Stroke, Bed 20" x 29"
215 ton Clearing, 24" Stroke, Bed 36" x 42"

PRESS—TOGGLE DRAWING
#168⅝ Toledo, 18" Stroke of Blankholder, 26" Stroke of Plunger, Bed 48" x 51"

PUNCH & SHEAR COMBINATIONS
Buffalo #1½ Ironworker
Cleveland Style C; Arch Jaw, Capy. ⅝" x ⅝"
Cleveland Style EF, Arch Jaw, Capy. 1⅛" x 1"

ROLL—CORRUGATING
#5 Stamco, Capy 16 Ga. Material 12" long 36" wide

ROLLING MILLS
6" x 5" Torrington Flat Wire Mill Line
8" x 10" Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
29" x 36" Single Stand Two High

ROLL—FORMING
18 Stand Custom Built, 2½ Shaft, will take 36" wide

ROLLS—PLATE STRAIGHTENERS
108" Bertsch, Seven Rolls 9" Dia.
72" Niles 7 Rolls 9" Dia. Motor Driven

SHEAR—ANGLE
6 x 6 x ⅝" Hilles & Jones

SHEAR—BILLET
Treadwell Billet Shear, Capacity 4" Sq.

SHEAR LINE
36" x .020 Ga. Hallden Shear Line

SHEARS—SQUARING
6' x 14 Ga. Edwards, Motor Drive—LATE
10' x ¼" Cincinnati
10' x ⅜" Niagara
14' x 3/16" Cincinnati #1814

SLITTERS
24" Blake & Johnson, 2¾" Dia. Arbor
36" Yoder, 4⅛" Dia. Arbor
98" Mesta Slitting & Trimmer, Capacity 3/16"

STRAIGHTENERS
¾" Lewis 4C with 22 Ft. Cut off
Shuster Shape Straightener, Capy. 1" Hex. Sq. Rd.
Torrington 12-Roll Capy. 1⅜" Sq. Etc.
Sleeper & Hartley #1 with Cut off, Capacity Wire .023" to .062" Dia.
No. 3 Medart 3 Roll, Capacity to 4½" Tubing

STRANDER
Syncro HS1-A 7-Wire Tubular High Speed Strander Cradle Bobbin O.D. Flange 6⅛", Traverse 3½"

SWAGING MACHINES
#4A Standard 2-Die, Capy. 2¼" Tube
#6½A Fenn Capacity 3⅜ Tube 1¼" Solid
10" Die Length Hydraulic Feed, LATE

THREAD ROLLER
No. 100 Waterbury Farrel Thread Roller

TUBE REDUCERS
1¼" Tube Reducer for steel
2½" Tube Reducer for aluminum

UNCOILER
48" Paxson Hydraulic Uncoiler

WIRE DRAWING MACHINE
Type B Morgan 4-Block Capy. #5 Rod down
Syncro BBS-11 Fine Wire Drawing Machine with Spooler, Starting size .028" dia. finish .003"
Scudder 3-Block 20", Capacity Start ¼"

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6,000# HAMMERS (2)
MODEL 6 CECOMATIC IMPACTERS

TWO PNEUMATIC HORIZONTAL OPPOSING IMPELLERS, AIR OPERATED, SERIAL NOS. 1386L1 and 1388L1, WITH FEED DEVICE, MFD. BY CHAMBERSBURG ENG CO. IN 1954. NEW, NEVER USED. NEW COST IN 1954 APPROX. $49,000.00 EACH.

A. O. HALL
1362 SHAWVIEW AVENUE
E. CLEVELAND 12, OHIO

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10,000# HAMMERS (2)
MODEL 10 CECOMATIC IMPACTERS

TWO PNEUMATIC HORIZONTAL OPPOSING IMPELLERS, AIR OPERATED, SERIAL NOS. 1391L1 AND 1392L1, WITH FEED DEVICE, MFD. BY CHAMBERSBURG ENG. CO. IN 1954. NEW, NEVER USED. NEW COST IN 1954 APPROX. $62,000.00 EACH.

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REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

Qu.	K.W.	Make	R.P.M.	Volts D.C.	Volts A.C.
3*	3500	Al.Ch.	514	250/700	13800/6900/4160
2*	2000	Whse.	720	600	4160/2400
1	2000	G.E.	450	250	4160/2400
1	1875	Whse.	514	250	13800/6900/4160
2	1250	Whse.	720	600	4160/2400
1	1250	G.E.	450	132/265	4160/2400
2	500	Whse.	1200	125/250	4000/2300
3	300	Whse.	1200	125/250	4000/2300
1*	300	Al.Ch.	1200	250/300	2300
1	250	G.E.	1200	250	440
3	200	Whse.	1200	125/250	4000/2300
1	150	G.E.	1200	250	4000/2300
1	150	C.W.	720	250	440
2	450	Mt. Mchy.	1200	125	2300

*—3 unit sets

SPECIAL
(1)—1250 K.V.A., Whse Hi-Cycle Frequency Set, 600 V., 960 cycle, with 1875 H.P., 2300 V., syn motor complete with all switch gear.

Qu.	K.W.	Make		Volts
1**	2200	Whse.	Mill	92/132
1**	1250	Al.Ch.	Mill	300/600
1**	1500	Whse.	F. Vent.	600
1**	800	Whse.	Mill	300
1	700	Whse.	Mill-E.B.	110/220
1	600	Whse.	Mill-QM	425/850
2**	600	Al.Ch.	MPC	400
1	400	G.E.	CD-175-A	850/1875
1	300	Whse.	MPC	400
2	275	Whse.	SK-184	575/1150
1	180	G.E.	CD-175	400/800
1	175	G.E.	F. Vent.	143/168
1	125	G.E.	461-T	1150/1500
1	125	Whse.	25-S	525/1050
1	100	G.E.	051-T	575/1150
1	100	Rel.	F. Vent.	300/700
1	80	Rl.Dy.	SK-181	500/1500
1	60	Rel.	Rmcl. F.C.	400/800
1	50/60	Whse.	T.E.F.C.	500/1500
1	50	G.E.	Mill	300/600
2	40/30	Whse.	Pad. Brg.	450

* 300/600-Volt
** 600-Volt

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STAMPING PRESSES

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WILL LEASE WITH OPTION TO PURCHASE, OR
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ROLLING MILL

10" dia. x 16" W.F. 2 High.
Herringbone Mill Pinions & Herringbone gear drive.
Anti-friction bearings to gearcase. 4¼" vert. adj. of top roll.
Mill complete and ready to run.
Extra set of rolls, 75 H.P. motor drive.

EXCELLENT CONDITION

LANG MACHINERY COMPANY, INC.
28th St. & A.V.R.R. Pittsburgh 22, Pa.
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OVER 1,000 NEW AND USED MACHINE TOOLS IN STOCK
WRITE FOR LATEST STOCK LIST

MILES MACHINERY COMPANY
2041 EAST GENESEE • SAGINAW, MICH. PL. 2-3105

40" Reversing, 2-High Blooming Mill, with D.C. motor.
1—AUTOMATIC COOLING BED FOR BARS up to 2" dia., consists of run-in table, cascade section, shuffle bar section, runout table, with all electrics, 200 ft. long.
1—28" x 48" HOT STRIP MILL, 2-high, reversing, with 2500 HP D.C. motor generator, etc.
1—25" & 42" x 90" HOT STRIP MILL, 4-high.
1—30" WIDE 4-HIGH COLD STRIP MILL.
1—28" PINION STAND, 2-high, modern design.
1—16½" x 24" 2-HIGH, 4-STAND TANDEM COLD MILL, individual D.C. drive motors, take-up reel.
1—18" x 22" COLD MILL, 2-high.
1—10" x 10" 2-HIGH COLD MILL, combination pinion stand and gear set, extra forged steel rolls.
1—8" x 10" COLD MILL including uncoiler, recoiler and edging rolls.
2—28" 3-HIGH ROLL STANDS with inlet, outlet and intermediate tables. Will produce 4" sq. billets from 8" sq. blooms in 6 passes.
1—12" MERCHANT BAR MILL with 10" roughing mill and heating furnace.
1—9" BAR MILL, 3-high.
1—Waterbury Farrel 6 head tandem rod mill for cold rolling wire.
2—MORGAN TRAVELING TILTING TABLES for 24" 3-high bar mill.

1—UNCOILER, drag type, 60" maximum width, for cold mill.
1—34" x 192" ROLL GRINDER.
1—ROLL GRINDER, capacity rolls 40" dia. x 172".
2—65-TON ELECTRIC MELTING FURNACES, TOP CHARGE, with all electrical and mechanical equipment, including 15,000 KVA and 13,333 KVA transformers.
2—80-TON ELECTRIC HOLDING FURNACES, each with 7500 KVA transformer.
2—PACK FURNACES for hot sheet mills, 62" x 60', double chamber.
2—90-TON HOT METAL TRANSFER CARS, Treadwell.
3—SLAG LADLE TRANSFER CARS, Blaw-Knox.
1—MORGAN INGOT STRIPPER CRANE, 50' span, 200 tons capacity, 230 volts D.C.
1—OPEN HEARTH CHARGING MACHINE, 5 ton capacity, 11' track gauge.
1—FLYING SHEAR FOR STRIP, Mesta, capacity hot mild steel 48" wide x ½" thick.
1—FLYING SHEAR FOR BARS, Morgan, up to 1½" square, moving at speeds up to 1800 FPM.
1—HALLDEN FLYING SHEAR LINE, capacity 36" wide x 20 to 34 gauge x 15" to 144" long.
1—PLATE SHEAR, MESTA, ½" x 156".

1—SHEET SQUARING SHEAR, capacity 156" x ¼".
1—SLITTING SHEAR FOR SHEETS, Mesta, 92".
1—UNITED HOT SAW, 50" dia. blade, sliding frame, 4'9" stroke.
1—ROLLER LEVELER, McKay, rolls 80" face x 5¼" dia. with gear box and universal spindles.
1—STRETCHER LEVELER for sheets, 500,000 lb.
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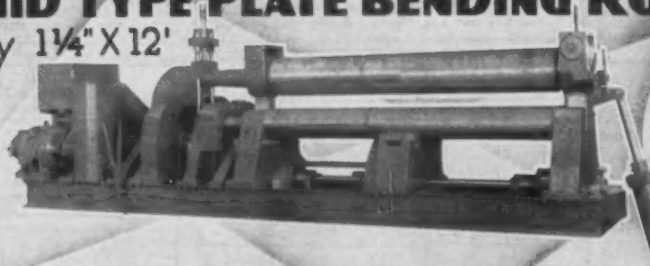

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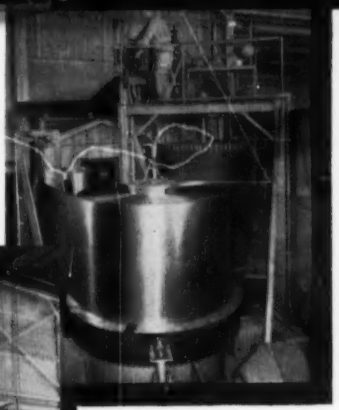
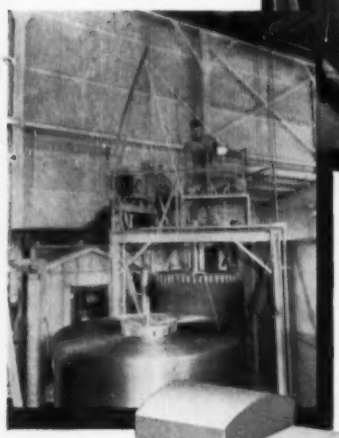


Right—Tight coil being opened. Note separator string being threaded into the coil.
Below—Separator string being removed from coil.



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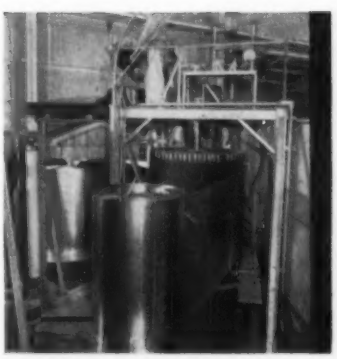

Opened coil being rewound into a tight coil after annealing.

2505

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MAKE THE BEST METALS BETTER

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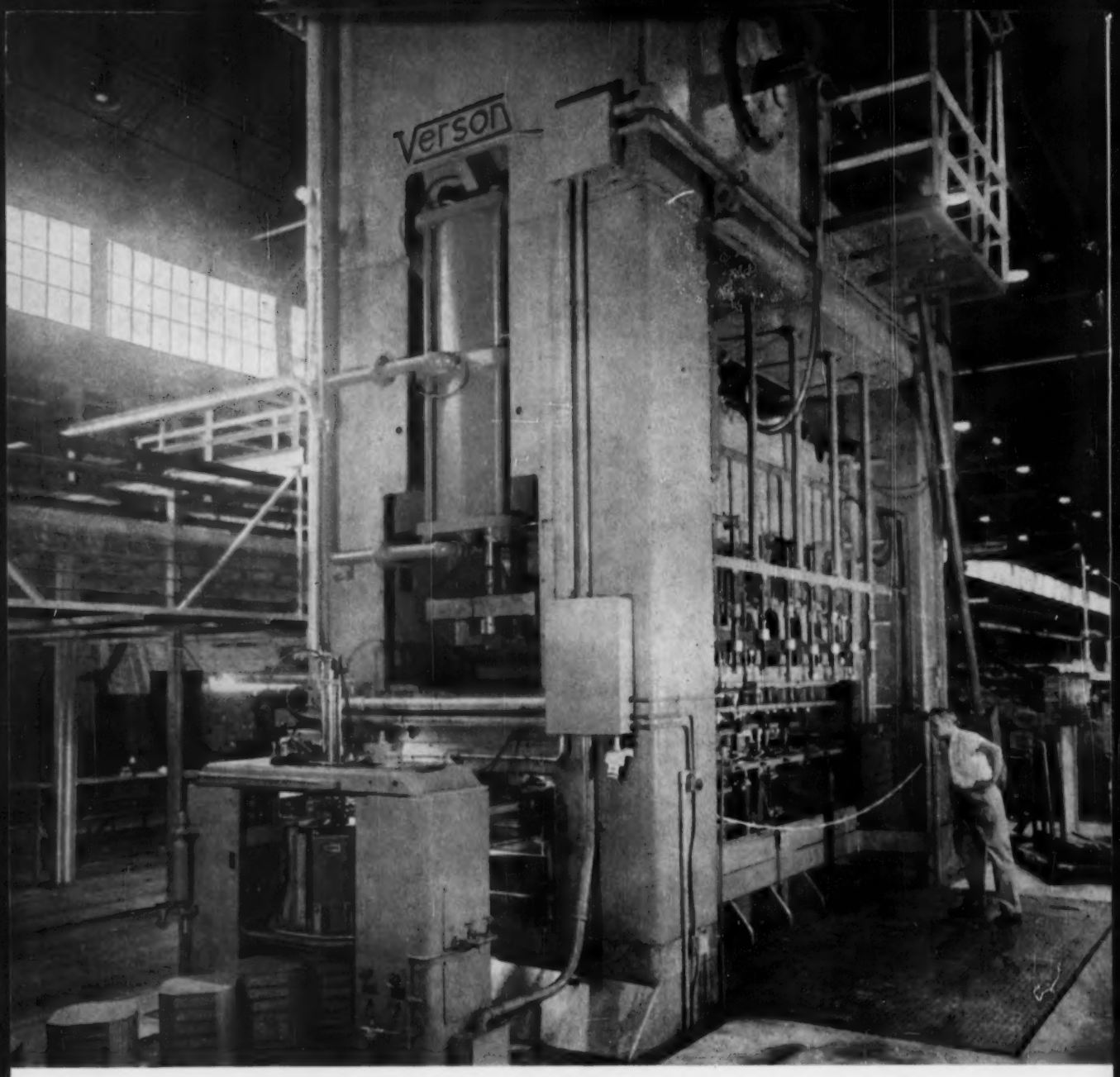

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